

*Happy
New Year!*

Newsline

Biotechnology pilot plant attracts business

Developing thimbleful quantities of a product in the laboratory is one thing, producing commercial amounts in kilograms or even tons is another.

That is where the Research Council's new biotechnology pilot plant will come to the fore - bridging the gap between laboratory and commercial production.

"The problem of going from the laboratory scale to real production is enormous and its solution costs huge sums of money," says Dr. Don Gerson, Head of the Biotechnology Department.

The Research Council recently signed a contract with BIO-FROST INC. to develop the scale-up to production processes for a snow- and ice-inducer called SNOMAX.

The ice nucleator was developed in the Berkeley, Calif. laboratories of Advanced Genetic Sciences (AGS), BIO-FROST's parent company, from a natural bacterium which is found on the leaves and stems of most plants growing in northern latitudes. While AGS has spent millions of dollars in the development of its product, the company has turned to the Research Council for the interim step of scaling up to production.

The finished product, a freeze-dried powder that mixes easily with water, greatly increases the efficiency of snow-making operations and is expected to find a ready market among commercial ski operators.

John Unsworth, president of BIO-FROST, says AGS is one of the first genetic engineering firms to come to Edmonton and predicts "many others will follow."

"We're here because the facilities and the people to handle the job are here - the Research Council has one of the most advanced facilities in the world for scale up of this type of bacteria."

The BIO-FROST contract is the first

of its type for the Biotechnology Department's new pilot plant. Between contracts, the research objectives of the pilot plant are to develop new techniques for computer-control and scale-up of fermentation processes.

Such techniques, which will reduce the time required to make effective

scale-up and reduce production costs, are central to the whole biotechnological process, says Dr. Gerson.

"With the pilot plant in Mill Woods, we have some very sophisticated computer, fermentation and recovery equipment," he said.

Dr. Gerson describes the difference between more conventional techniques and the Biotechnology Department's new pilot plant capabilities to the difference between a fast food outlet and a high class buffet.

"Usually you grow a large quantity of bacteria in a large container filled up with a solution of all the food the bacteria will ever use. You put in the bacteria and they grow until you have the most bacteria and the least food. Ultimately the bacteria die of starvation. With our techniques, using a computer and sophisticated sensors to monitor the bacteria, we watch what they are eating, watch their metabolism and keep on feeding them. The bacteria have as much as they want to eat, no matter how many bacteria there are, thus enhancing production."

The \$3 million pilot plant, being built and equipped with provincial government funding to attract new start-up biotechnology firms such as BIO-FROST, will allow the Research Council to work on a number of projects at one time.

"The pilot plant will last a long time," says Dr. Gerson. "We hope many companies will do their piloting and scale-up here, using this facility and that a fraction of these companies will stay in Alberta and go on to production. Then Alberta benefits from the increased economic activity."

BIO-FROST has indicated that it plans to manufacture SNOMAX in Edmonton for distribution in North American markets once scale-up is completed.



A test tube of water begins freezing almost instantly when ice-nucleator is added during a laboratory demonstration in the Research Council's Biotechnology Department. The ice nucleator was developed from the bacteria found on tree leaves and branches which create those spectacular winter wonderland effects.

Newsline is a monthly publication for the employees of the Alberta Research Council.

Please send all submissions and direct all questions to Elizabeth Page, Alberta Research Council, 7th Floor, Terrace Plaza, 4445 Calgary Trail South, Edmonton, Alberta T6H 5R7

**ALBERTA
RESEARCH
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Dr. Stewart outlines prospects for 1985

Six new joint research ventures between the Research Council and Calgary-based high technology firms are expected to be launched in 1985, and there will be other areas of faster growth for the organization says president Dr. Robert W. Stewart.

With funding approved for more joint research ventures, he sees an expansion in staff, equipment and computer time for the new Advanced Technologies Department in Calgary.

Mill Woods: target dates

September 30 is the target date for completing the staff move to Mill Woods.

The contractor, A.V. Carlson Construction Corporation Ltd., expects to complete the interior on time by April 16, allowing separate outfitting contractors to complete the laboratories in Area 3 (west) by June 1 and Area 4 (east) by August 1.

The target date for completion of outfitting in the central computer area is August 1 with installation of equipment continuing until September 30.

Offices throughout the complex are expected to be available throughout June and July.

Mid-April is the contractual completion date for the Biotechnology Pilot Plant, provided special components arrive on schedule; July 1 is the scheduled completion date for outfitting the electronic products test centre.

Some departments cannot move prior to September 15 because of the nature of their research commitments. Discussions will be held with each department to determine dates which will have a minimal impact on their research.

Any moves earlier than these projected dates are remote, but it is hoped the target dates can be met and that everybody from the Campus building and those slated to go from Terrace Plaza will be moved by September 30.

In addition, he noted a greater focus on the Industrial Development Department's assistance programs in that city.

He suggested there could be some growth for the Research Council resulting from the provincial government's white paper on the economy: "we have been asked in the white paper to develop an innovation office, but we don't yet have its nature or timing."

But the days of mushrooming growth in the public service and crown corporations are over, and while he doesn't see any particular area in the Research Council which might be pruned, Dr. Stewart made it clear that he doesn't want "people acting on assumptions that aren't true."

In an interview for Newsline, he said "we had a sharp reduction in our Chemistry Department and IDD branch in 1984, and undoubtedly there will be some other shifts. I'm not able to identify what they are going to be ... (but) I haven't got a hit list."

Dr. Stewart said the nature of the public service at every level has undergone a serious change from the paternalistic role of the past when an employee could be guaranteed a job for as long as he wished.

"That change takes us closer to the private sector in the way we have to operate and the new reality is that the public service and crown corporations are not going to grow much. Some people can be redirected and retrained, but others have to be let go when an organization is shrinking too fast for attrition."

The major shift of emphasis in the Research Council's mandate initiated under former president Dr. Gilles Cloutier is beginning to bear fruit, changing the nature of some Research Council problems, said Dr. Stewart.

"It's stimulating to be discussing with senior management the best ways of handling our successes," he commented, citing as examples the development of a membrane gas separation technique, considered fully competitive in the world, and a sand exclusion device developed for Texaco Canada Resources Ltd.

"Once something is produced, the Research Council has to learn how to get it out in society or our work is not very useful ... we will have to play an active role in seeing this is done so the things we develop don't languish."

Locating suitable manufacturers and

nursing a project up to production through technical advice, quality control and testing assistance, are roles the Research Council could adopt in this regard, he suggested.

Taking a look at the national R and D scene, Dr. Stewart observed that the new federal government is anxious to have more research and development done by the private sector. He doesn't think Alberta will be particularly affected by federal changes "because the federal government doesn't spend much here. Over the last decade the Alberta government has been spending enough in research dollars to bring total expenditures up to what the federal government spends in Ontario."

The Research Council's move to new quarters in Mill Woods, slated for later this year, "is going to bring more of us together than we have had for a long time and I hope it will make a difference in the way we function," Dr. Stewart said. "It's a handsome new facility and should give us a greater sense of commonality and unity."

One-day workshop

Dean Wallace, manager of the Research Council's Oil Sands Sample Bank, will be one of the speakers at a one-day workshop on Sampling for Chemical Analysis, being held May 3 at the University of Alberta.

The workshop will cover the theory and practice of sampling bulk materials, an important part of practical chemical analysis. Among the subjects to be discussed are the statistical design of sampling and sub-sampling plans, apparatus and procedures for sampling solids, liquids and gases, standard protocols for certain commercial and regulatory analyses, and application of sampling to industrial, clinical and environmental problems.

Other speakers will include Prof. Ron Kratochvil, Department of Chemistry, University of Alberta.

The workshop is one in a series organized by the Chemical Institute of Canada (C.I.C.) education committee under the chairmanship of Dr. Zac George. For further information about the workshop, contact Dr. George at the Campus Building, 11315 - 87 Avenue, tel. 439-5916.

New safety policy - the eyes have it

In an effort to reduce and eliminate eye injuries in the workplace, the Research Council is implementing an eye protection policy requiring all employees in designated eye protection areas to wear specified safety glasses.

Employees carrying out certain tasks will be required to wear additional eye protection such as goggles or face shields. The policy also stipulates that anyone entering the designated areas must wear visitor safety glasses.

In the laboratory where chemicals and other liquids are being transferred from one vessel to another, often under heat and pressure, in products' testing facilities and the machine shop, where materials are being cut and welded, the potential for eye injuries is constant. Even when accidents occur, most eye injuries need not be the result.

"Eye safety cannot be stressed too strongly," says Bill Cherpeta, Vice-President of Finance and Administration. "In one 13-month period between 1983-84, the Research Council had 10 eye reported injuries, two of which resulted in time lost from work."

In all cases, he noted, the injury could have been minimized or prevented by

the wearing of correct eye protection.

"More than half our employees work in either a laboratory or pilot plant where it is imperative that eye safety procedures be followed. The statistics showing the dramatic increase in eye injuries a year ago point to the need for an enforced eye safety policy."

The new policy is hardly a bolt from the blue - the Research Council already has designated areas where eye protection gear must be worn in accordance with the Occupational Health and Safety Act of Alberta. What is new is a policy tailored for the Research Council, setting out standards, procedures and responsibility for enforcement of the regulations.

The policy has been developed by the Occupational Health unit and Safety, in consultation with the Professional Staff Association and the Alberta Union of Provincial Employees, Local 60.

The Research Council will bear the costs of supplying non-prescription safety glasses and prescription safety glasses. Employees requiring prescription safety glasses will be responsible for costs in obtaining the prescription itself.

Goggles and visitor safety glasses have been chosen by a selection committee. No decision has been made regarding other safety glasses.

"A decision on non-prescription safety glasses was deferred because the products reviewed by the selection committee didn't meet our criteria," says Stephanie Wilson, Occupational Health nurse. "All approved industrial glasses are designed for impact



This scientist takes proper precaution with safety glasses.

resistance while we need the type of glasses that will stand up to both impact and the effects of chemical exposure. In labs where chemicals are being used, glass is preferable over plastic."

Safety Coordinator Eugene Parranto, in consultation with department heads, will jointly determine the designated eye protection areas. Enforcement of the regulations will be the responsibility of individual managers and supervisors.

"You just don't have injuries to the eyes that are not serious," says Eugene Parranto.

The fact that eye injuries occur daily in the Alberta workplace is reflected in these statistics: in 1982, the Workers Compensation Board received nearly 6,000 claims for eye injuries. Total compensation and medical costs totalled just under \$1 million and resulted in 12,437 compensation days.

A strictly enforced eye protection policy can go a long way toward keeping Research Council employees from being included in such statistics.

The selection committee takes a look at safety glasses: from left, Eugene Parranto, Safety Coordinator, Joe Hruschak, representing the Alberta Union of Provincial Employees, Local 60, Stephanie Wilson, Occupational Health nurse, and Anne Koots, president of the Professional Staff Association.



About Dinosaurs

Dinosaurs: Remains To Be Seen will be the feature on CBC's Nature of Things January 9 at 8 p.m. The program includes scenes filmed in Alberta's Dinosaur Provincial Park with coverage by Dr. Emlyn Koster, of the Geological Survey Department, of one way in which sedimentological research helps to unravel the life and times of the dinosaur.



Laurence Andriashek, Terrain Sciences Department, has received his Master of Science in geology from the University of Alberta. The topic of his thesis was the Quaternary stratigraphy of the Cold Lake area.

Lunch hour activities

Bring your lunch and check out your lifestyle.

Your health unit is offering a series of brown bag Wednesdays once a month at our various locations, starting January 9 at the Terrace lunch room.

Other brown bag Wednesdays will be held January 16 in the Campus building conference room; January 23 in Clover Bar conference room; and January 30 at Devon Research Center, Rooms 130 and 131.

Activities will start at 12:15 p.m. and last about three-quarters of an hour.

Stretch - two, three, four.

Staff at the Devon Coal Research Center are beating the winter blahs with a twice-weekly exercise routine.

Every Monday and Thursday at noon, Mona Barron of the Coal Technology Information Center (with an assist from Jane Fonda) takes the group through a complete workout.

The half hour sessions are growing in popularity, says Mona. CANMET and Public Works employees have joined Research Council people, and she extends an invitation to anyone visiting Devon.

Visiting scientist

Paul Smith's interest in the Research Council's radar technology has brought him to the Atmospheric Sciences Department (ASD) as Visiting Scientist for the next year.

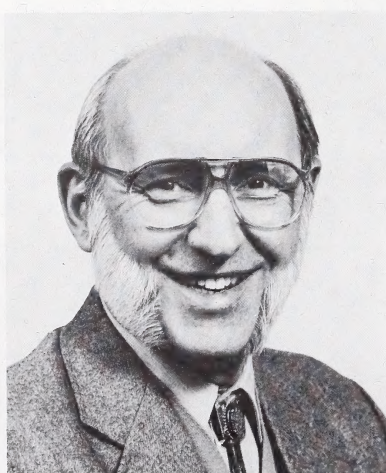
Dr. Smith is Director of the Institute of Atmospheric Sciences at the South Dakota School of Mines and Technology, which has a variety of programs similar to the Research Council's in cloud physics, hail suppression and weather modification.

"We have research aircraft and operate a weather radar system, but we don't have the polarization radar the Research Council has at Penhold," he said.

He first visited Penhold in 1967 after moving to South Dakota to do research in weather modification. His major current projects include hail storm investigations and an evaluation of weather modification being carried out in North Dakota.

Dr. Smith is a graduate in physics and electrical engineering from Carnegie Mellon University in Pittsburgh, and spent a year on a post doctoral fellowship in meteorology at McGill University. He spent three years working on weather radar at the Midwest Research Institute, Kansas City, before moving to the South Dakota School of Mines and Technology where he also teaches.

While at the Research Council he is working with ASD's radar group on interpretation of polarization data and on hail suppression data to develop concepts, implementation and evaluation of cloud seeding experiments.



Paul Smith



Sharon Gee, manager of the Research Council's Library Services, presented a copy of SCITECH software to Wendy Kinsella, director of Library Services, Alberta Labour. SCITECH, a public online catalogue on SPIRES at the University of Alberta, was created and developed by the library staff of the Research Council, Alberta Agriculture and Alberta Environment. The technology transfer, through an agreement signed with Alberta Labour, authorizes the use of SCITECH software by the department's library.

Employee changes

We welcome to the Research Council the following: **Peggy Burgess**, Administrative Officer, Oil Sands Research; **Robert DuWors**, Research Officer, Advanced Technologies; **Conrad Gietz**, Administrative Professional Officer, Editing; **Lorne Green**, Research Technologist, Coal Research; **Brian Hunt**, Machinist, Materials and Testing; **Jerzy Janiak**, Technical Officer, Coal Research; **Alan Jones**, Research Officer, Biotechnology; **Donna Letang**, Senior Secretary, Advanced Technologies; **Cheryl Hutton**, **Kathie Maitland**, Industrial and Engineering Research, and **Adele Lippolt**, Materials and Testing, Clerk Typists; **Wanda Pawlak** and **Ali Turak**, Technical Officers, Coal Research.

We wish the following well in new endeavours: **Fahmy Gadallah**, Chemistry; **Brenda Leskiw**, Facilities Management; **Franciscus Louman**, Oil Sands Research; **Zorina Manoharan**, Oil Sands Research and **Thomas Saunders**, Geological Survey.

Newsline

Department changes made

A name change for one research division and a realignment of responsibilities among three research divisions, effective January 1, have been announced by the president, Dr. R.W. Stewart.

The Frontier Sciences Division has been renamed the Applied Sciences Division, remaining under Vice-President Dr. Duncan Currie. The Materials and Testing Department, formerly under the Industrial and Engineering Research Division, is now under the responsibility of the Applied Sciences Division. This change will complement other testing and analytical activities of the division.

With the emphasis on water-related and geotechnical functions in the Civil Engineering Department and the inter-related work between Civil Engineering, Terrain Sciences and the Geological Survey Departments, the Civil Engineering Department has been transferred to the Natural Resources Division under Vice-President Dr. Ken Babcock.

The transfers have been made due to the increased responsibilities of Dr. David Mitchell as regional vice-president in Calgary.

In order to strengthen the Research Council's presence in Calgary, the following Industrial and Engineering Research Division activities will be conducted from the Calgary office: Advanced Technologies Department, already located there; the Industrial Development Department (with an Edmonton office); and Program Development, which will serve to enhance the business development requirements of the Calgary office.

The Electronics Test Centre being established in Edmonton will remain under Dr. Mitchell's direction.



Looking up - photographer John Gertz captured this unusual view of the Electronics Test Centre at Mill Woods. The facility in the Research Council's new complex will offer product evaluation and research support to the western electronics industry; and is expected to be fully operational this year.

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Code of Ethics Research Council policy

ETHIC: *The discipline dealing with what is good and bad and with moral duty and obligation* - Webster.

In the preamble to the Code of Conduct and Ethics for the Staff of the Alberta Research Council is the statement: The Alberta Research Council accepts the obligation to carry out all its activities with integrity, impartiality and efficiency and recognizes that this demands high standards of conduct and ethics from its staff.

While the general principles of integrity, competence and dedication to service apply to all Research Council staff, including those hired under an employment contract, the new code of ethics addresses the two areas of particular concern for management and professional staff - private consulting and teaching.

A written code is essential, says Dr. Ken Babcock, Vice-President of Natural Resources and Chairman of the ARC/PSA Joint Committee. He says the policy is designed to remove potential areas of dispute - "previous ambiguity about what constituted a conflict of interest, both by the professional and his superior in some cases resulted in embarrassment for the

organization and discomfort to staff members."

In the past, the Research Council followed the public service code although restrictions were imposed where a conflict of interest with the private sector or breach of confidentiality in regard to Research Council contracts might occur. Some leeway was allowed in situations where a scientist could, for example, do consulting work outside the province, the rationale being that the Research Council is a provincial organization. But that door has been essentially closed.

Dr. Robert Green, Vice-President of Operations, points out "we've come to the realization that Alberta is not an island. Since the province is influenced by world factors and world markets, we cannot afford to be limited any longer by the geographic boundaries of the province."

An attempt to set rules for consulting and teaching was made six years ago by a committee chaired by Dr. Harry Habgood. That result was "much more restrictive" says Anne Koots, past president of the Professional Staff Association. Three years ago a joint ARC/PSA committee began a review and discussion which has led to the new

policy, a first for the Research Council.

"There are still lots of restrictions in the new code, but the opportunity now exists for a person to apply for permission to do consulting as long as it doesn't conflict with his job or with the Research Council's work. And the code opens up teaching," Anne said.

She says the PSA "asked for more than it got, but it did achieve some leniency and the code is more progressive. What management fears is an abuse of consulting privileges, and how well the Research Council operates under the new code will determine what measures management is inclined to entertain in the future."

With the number of industrial contracts in oil sands research, staff must appreciate that opportunities for consulting are limited, says department head Gary Martin.

Dr. Green agrees the code places constraints on some staff to earn extra income through consulting and also a moral obligation to declare their potential conflict. As to staff considering teaching, such thorny questions as use of the Research Council's name and who receives the fee if the Research Council allows the time for preparation, delivery and travel, do not make it a "neat and tidy area."

"The code is a good document and a good compromise," says Dr. Green. He added that management must be consistent in the way the code is applied - "what is the rule for one division must be the rule for another."

While the Alberta Research Council's code of ethics may appear restrictive, it at least provides its employees with the opportunity and the guidelines for applying for permission to teach or take on some consulting work, unlike its sister organizations. The Ontario Research Foundation prohibits consulting work by its staff as a condition of employment and B.C. Research deals with the subject by bluntly forbidding any consulting.

In his letter to staff accompanying the new policy, Dr. Green suggested a principle of openness could help in administering the code.

"Every employee is encouraged to discuss with their immediate supervisor or department head any actions or situations where the propriety of that action or situation is in doubt. This will greatly lessen the possibility of conflict."



National Research Council administrators visited the Alberta Research Council as part of a first-hand look at NRC programs in Alberta. Taking a break from discussions for this photo are, seated, Dr. William Coderre, executive manager, NRC Industry Development Office; Dr. Robert W. Stewart, president, Alberta Research Council; John Braams, IRAP general manager, NRC; standing, Dr. Alan Vanterpoo, Office of Science and Technology, Alberta; Dr. David Mitchell, Alberta Research Council vice-president of Industrial and Engineering Research and regional vice-president; Dr. John Vose, PILP general manager, NRC; and Andy Gilliland, NRC co-ordinator for IRAP in Alberta.

Some recent reports from Publications Sales

The following is a list of recent published papers by Research Council staff available from Publications Sales, 5th Floor, Terrace Plaza:

- Controls on Hydrocarbon Accumulation in Glauconitic Sandstone, Suffield Heavy Oil Sands, Southern Alberta, *by Barbara J. Tilley and Fred J. Longstaffe;*

- Effect of Mineral Transformation on Porosity and Permeability of Dolomite Rock During In Situ Recovery of Bitumen: *A Preliminary Study by Witold Kubacki, Jan Boon, Gordon Bird and Brian Wiwchar;*
- Protonation of Polyethers, Glymes and Crown Ethers, in the Gas Phase, *by Ram B. Sharma, Arthur*



Now see here - facilities coordinator Vic Jackson describes how the Mill Woods complex will look when we move in this year. The interested group are some of the staff who toured the new building during the annual staff meeting.

- T. Blades and Paul Kebarle;*
- Crop damage and sulfur emission trends in central Alberta, *by Raymond K.W. Wong and Marianne English;*
- Propionate Exchange Reactions in Methanogenic Ecosystems, *by David R. Boone;*
- A five-coordinate dicarbonyl rhodium(I) complex containing monohapto-2-diphenylphosphinothiophene: $(\text{RhCl}(\text{CO})_2(\text{DPT})_2)$, *by Alan R. Sanger;*
- Nature of porosity in Alberta sub-bituminous coals, *by S. Parkash, S.K. Chakrabarty and M.P. du Plessis;*
- Thermal Breakup Predictions on a Regulated River, *by David D. Andres;*
- Physico-Chemical Characterization of Athabasca Oil Sand and Its Significance to Bitumen Recovery, *by Koichi Takamura;*
- Structural and Sedimentological Framework of Lower Cretaceous Coal-Bearing Rocks in the Grande Cache Area, Alberta, *by C.W. Langenberg;*
- Ice-Nucleating Bacteria and Ice-Nucleating Bacteria Isolated from the Ellerslie Farm, *by Toshi Kaneda;*
- Bitumen Upgrading Using Synthesis Gas and Calcium oxide, *by F.F. Gadallah and Peter T. Mohammed;*
- Analysis of breakup and ice jams on the Athabasca River at Fort McMurray, Alberta, *by D.D. Andres and P.F. Doyle;*
- Contribution of vitrinite macerals to the liquefaction of sub-bituminous coals, *by S. Parkash, K. Lali, M. Holuszko and M.P. du Plessis;*
- Development of shoreline-shelf sand bodies in a cretaceous epeiric sea deposit *by Douglas J. Cant;*
- An overview of wind energy research by the Alberta Research Council including wind pumping preliminary test results, *by H.B. Luft;*
- The polarization properties of fine scale reflectivity patterns within a severe storm, *by R.G. Humphries and F. Bergwall;*
- Application of till pebble lithology to the differentiation of glacial lobes in southern Alberta, *by I. Shetsen.*

Superb sessions says Sanger

"International conferences are enormously important for the exchange of ideas and information, and for increasing understanding in the scientific community," says Dr. Alan Sanger, Chemistry Department.

The 1984 International Chemical Congress of Pacific Basin Societies, held in Honolulu in December, is a case in point, says Alan. Organized by the Japanese Chemical Society, the Chemical Society of Canada and the American Chemical Society, the conference attracted 4,000 scientists from Pacific Rim countries, including 400 Canadians.

"It was a fine conference and all the sessions in the symposium on the use of synthesis gas were superb," he said. He also organized and chaired one of these sessions which he

described as "top notch".

Authors of papers, the type of work discussed and particularly the relevance to work being done at the Research Council were Alan's criteria for judging the conference. Among the speakers were seven Nobel prize winners.

In a different session he gave a paper on the structure of recently discovered rhodium complexes at the Research Council and their relationship to catalytic reactions involving carbon monoxide.

In total, more than 200 sessions during the five days covered topics related to climate, agriculture, volcanoes, practical industrial chemistry to the most esoteric chemical studies, and a session on the scientific basis of folk medicine.

Dr. David Mitchell named to Authority

Dr. David Mitchell, regional vice-president in Calgary, has been nominated to the Calgary Research and Development Authority for a two-year term. Dr. Mitchell's appointment "reflects the desire of the Authority to establish an ongoing cooperative relationship with the Research Council," said W.D. Croft, president, in making the announcement.

The three parties of the Calgary Research and Development Authority are the Chamber of Commerce, the City of Calgary and the University of Calgary.

Energy markets conference

The Canadian Energy Research Institute and the Toronto Board of Trade are sponsoring the North American Energy Markets Conference March 4 and 5 at the Sheraton Centre, Toronto.

Keynote speakers will be Hon. Pat Carney, Minister of Energy, Mines and Resources, Danny J. Boggs, Deputy Secretary, U.S. Department of Energy, and Alan S. Blinder, Princeton University.

The Canadian Energy Research Institute is a non-profit research organization sponsored by various Canadian government agencies and approximately 60 energy companies.

Employee changes

We welcome to the Research Council the following: **Gordon Heck**, Research Technologist, Coal Research; **Robert Morris**, Research Technologist, Atmospheric Sciences; **Allan Prost**, Research Technologist, Geological Survey; **John Stray**, Research Officer, Computing.

We wish the following well in new endeavours: **Joan McMeeken**, Editing and Publications Sales; **John Nurkowski**, Geological Survey; **Doris Regula**, Oil Sands Research; and **Nancy Thompson**, Coal Research.



Instructor Jan Logan, Occupational Health Unit, centre, with Sharon Arms and Terry Painter, Chemistry Department, and Chris Meintzer, Biotechnology Department, during C.P.R. recertification course at Campus. The Occupational Health Unit is offering the C.P.R. courses monthly with the opportunity to recertify each year. Initially instruction will be given to people working in a lab environment or on an emergency rescue squad.

PSA names new executive for 1985

Alan Sanger (Chemistry) is the new president of the Professional Staff Association. Other officers for 1985 are:

Anne Koots (Oil Sands), past president; Claude Sauveplane (Geological Survey), vice-president; Bryan Fuhr (Oil Sands), executive secretary; Surinder Singh (Oil Sands), recording secretary; Bob Kochtubajda (Atmospheric Sciences), treasurer.

Divisional representatives elected: Baki Ozum (Coal Research) and Raj Rajan (Oil Sands) - Energy Resources; Ed Bertram (Materials and Testing) - Industrial and Engineering Research; Frank Tuck (Editing) Finance and Administration; Mark Lazar (Biotechnology) - Applied Sciences; Laurence Andriaschek (Terrain

Sciences) and Joe McGillivray (Geological Survey) - Natural Resources.

Committee chairmen are Jerry Fullen (Library), membership; M. Oleskiw (Atmospheric Sciences) - Professional Development, and Hollemeyer (Machine Shop) - Occupational Health.

The PSA annual general meeting will be held February 5 at 2:30 p.m. in Ballroom C, Terrace Inn.

Research Council goes underground

The Research Council display has found a temporary root in the Alberta Government Centre Pedway Mall near the entrance to Exhibition Hall where it will remain until the end of March.

The pedway is the underground walkway between the Legislature Building and the other Government Centre offices. Our display is easily accessible to a considerable foot traffic, and is included in the tour route of numerous groups visiting the Legislature and the exhibit.

Medical claims

Staff covered by major medical and dental plans must submit all claims for the 1984 benefit year to Pay and Benefits Section by March 29 in order to receive reimbursement by Northern Life Assurance Company.

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New joint research venture announced

A century ago when the Dominion Land Survey began in western Canada, surveyors faced the monumental task of turning the rough charts of the early explorers into the precise, ordered maps we use today. Guided by the stars and mathematical tables - there were no time signals or latter day technologies such as satellites - they plotted townships, homesteads, roads, railway lines.

With settlement and development, maps reflected more information - the locations of oil wells and pipelines, for example.

Now the Research Council, in a joint research venture with Calgarybased Q.C. Data Collectors Ltd., will broach the high tech frontier to give the business of mapping another dimension. With the signing of a two-year \$700,000 contract, the Research Council and Q.C. Data begin work to develop a unique system for automatically digitizing maps and similar documents.

"The results of the project are intended to make the map data more accessible and manageable for analysis," says Dr. Brian Barge, Head of

Advanced

Technologies, the Research Council's program handling this joint research venture. "Its uniqueness lies in the presentation."

The project is an overlay in reverse-taking the overall images from the map step by step to be translated into lists in a computer memory. The data will be placed on a disk or tape which then will be available to the customer.

The challenge, says project manager Kevin O'Connor of Q.C. Data, is to transform what is now represented on paper to a computer program where the data can be manipulated to show the relationships between different features found on maps.

"A lot of people rely on maps. Taking the information from a map to store in a computer memory is the sort of work now done by hand - a very tedious process," says Mr. O'Connor. "The tremendous power of modern microprocessors and the drastically reduced price of digital integrated circuit memory chips allows us to build a microprocessing system that can efficiently perform the image-processing task less expensively than purchasing existing hardware."

The most difficult part of the project will be writing the software programs

which will allow the computer to distinguish the lines and symbols on maps. Q.C. Data already has developed software for automated oil well log (OWL) digitizing and the OWL scanner will be adapted initially to layered contour maps. But map scanning is much more complicated and the areas to cover much larger, says Mr. O'Connor.

The Research Council is providing assistance in high speed microcomputer digitizing and graphics and the project will be carried out at the Research Council's Calgary facility.

"This joint research venture reflects the aims of the Advanced Technologies program - applying advanced computing technology toward enhancing the competitive edge of Alberta industry," says Dr. Barge.

The potential market is enormous and includes maps and engineering drawings now being converted to automated CAD/CAM data bases. Automated digitizing is expected to be highly cost efficient—estimates indicate that present costs of \$2000 to \$3000 for producing digitized documents could shrink to one-tenth these amounts.

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Mapping goes digital



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Oil sands researchers pool talents

Three oil sands researchers have pooled their scientific know-how to develop a numerical reservoir model that gives them a new perspective on the bitumen recovery process. The work on silica transport by Jan Boon, Gordon Bird and Terry Stone has piqued industry interest and lays the foundation for further studies on other underground minerals.

One of the primary components of oil sands is silica. When hot steam or water is pumped into oil sands reservoirs to free the oil, the silica dissolves and travels wherever the water goes.

The story begins with Dr. Jan Boon when he joined the Research Council a decade ago as a chemist working in oil sands research. Jan felt that by analyzing the variation in the small quantities of silica carried by the water, he could gain a better understanding of what happens underground. He began collecting data on silica transport and measuring its dissolution rate, but could not unravel its mysteries then because he lacked a mathematical model. A few years later he was joined by geologist Dr. Gordon Bird, and together they completed work on the

dissolution and precipitation reactions that control silica transport. They developed a simple mathematical equation to explain how much silica from the sand grains dissolves in water.

Dr. Boon's initial theory became a reality, but the results model had limited practicality until they took their work to Terry Stone. Dr. Stone incorporated their simple equation into a large, sophisticated mathematical model that simulates steam injection into oil sands for the bitumen recovery process, and in so doing moved the description of silica transport from the micro to the macro level. Experiments carried out in the Oil Sands Research Department's large physical simulator verified the numerical model.

A year later, Dr. Stone says he is beginning to see results - "and I can now see how right Jan really was." These results could play an important part in the future development of bitumen recovery processes. The extreme heat and pressure from the steam forced through an injection well can cause underground fractures and in many cases the water does not travel on

a direct course to the production well. Dr. Stone hopes his model will be able to predict where the water is flowing as well as helping scientists and engineers to "see" how much sand the injected water is meeting.

Injection and production wells can operate for years, but water continually running through the underground sand has been known to contribute to well collapse. If researchers are able to document the variations in silica in production fluids, they can accurately determine how much sand is being dissolved and transported. This way, long term damage caused by quartz dissolution around the wellbore can be predicted.

The story doesn't end with the experiments on silica transport. Dr. Bird has completed preliminary experiments on the interaction of condensed steam with carbonates, kaolinite and quartz and Dr. Stone hopes this year to extend the silica model to include analysis of such minerals. The same approach can be used to determine the fate of other chemicals, such as surfactants, that may be injected along with the steam.

CTIC signs contract

The Coal Technology Information Centre (CTIC) has signed a contract with the Technical Information Division, CANMET, Ottawa to provide codes, keywords and abstracts of coal-related material published in Canada. The material is part of the Canadian contribution to the International Energy Agency's coal abstracts data base.

CTIC is jointly funded by the Research Council and the Alberta/Canada Energy Resources Research Fund, administered by Alberta Energy and Natural Resources, and provides information to industry, government and the general public.

continued from page 1

Success of the joint research venture will mean an Alberta-made product that can take pride of place in the field of advanced technologies, adding a new chapter to map-making.



A group of chemical and industrial process students from NAIT recently toured the Coal Research Department's facilities at Devon. Three of the students are pictured with research officers David Aitchison and Angelo Iacchelli.

Soil research down - to - earth

This spring, the Research Council begins a joint research project with Alberta Agriculture and Agriculture Canada to conduct a land inventory of soils, surficial geology and some aspects of hydrology in Flagstaff County.

"Lands in east central Alberta could be more productive if soils responsive to improvements are properly identified," says soils scientist and project leader Bob MacMillan, Terrain Sciences Department.

More research, particularly soil research, is needed says the Environment Council of Alberta (ECA). In a recent report, containing recommendations on maintaining and expanding the province's agricultural land base, the ECA said soil degradation by wind, water and cultural practices contributes to reduced productivity of the agricultural land base, and can become a major factor in Alberta's ability to maintain or expand agricultural production.

The Research Council's proposed project will be an experiment in integrating three scientific disciplines to expand the research and develop techniques to produce three products at the same time.

"From the soil scientists we will get a map and description of the soils while the geologists, using samples from the soils people plus their own research, will be providing an upgraded geological description of the area. Groundwater/hydrology studies, we hope, will be useful in helping us to understand and predict behaviour related to drainage, erosion and flooding," says Bob.

The field work will be carried out by researchers from the Research Council's Terrain Sciences Department and Agriculture Canada - the first such co-operative venture in 15 years. Alberta Agriculture is contributing funding to the project.

At the same time, Bob says, the Terrain Sciences Department will carry out a parallel project in mapping technology to test newer techniques of data gathering against traditional methods and compare them for cost efficiency.



Representatives from the panel products industry take a look at machine stiffness rating apparatus developed in the Research Council's Forest Products laboratory.

Industry gets look at MSR apparatus

After two years in the experimental stage, a machine stiffness rating (MSR) apparatus developed in the Forest Products research laboratory, has been unveiled for Alberta industry.

In a one-day workshop, representatives from Alberta panel products manufacturers had an opportunity to discuss non-destructive testing of panel products and the potential economic

benefits of the MSR concept. The Research Council is seeking industry input in determining the future development of commercial on-line equipment for use in Alberta mills.

Lars Bach, Manager of Forest Products research, believes MSR is the answer to cost-efficient grading of panel products. The present grading systems are slow, time-consuming and, he says, there are difficulties in maintaining uniform stiffness and strength in panel production.

MSR could reduce the guesswork by on-line non-destructive testing, providing quality control. Lars also sees MSR as a tool for grading panel products to accepted standards.

Floor and roof sheathing, concrete formwork, preserved wood foundations and structural elements are potential uses for structural MSR panel products.

Vehicle stickers

Are you the proud owner of a new vehicle? If so, don't forget to get a parking sticker to avoid getting a parking ticket. See Lynda Strader, 6th Floor, Terrace Plaza.

CLRA meeting April 16-17

Dr. Robert J. Fessenden, Head of the Terrain Sciences Department, is chairman of the organizing committee for the Alberta Reclamation Conference '85: Planning and Certification of Land Reclamation, being held April 16 and 17 at the Edmonton Inn.

Sponsored by the Alberta Chapter/Canadian Land Reclamation Association, the conference will present information on planning and certification, establishing reclamation objectives, and case studies in certification of Alberta coal mines. Invited speakers from government, industry and the public will present papers.

Participants enthusiastic about in-house course

Text book theory has its place, but simulating real-life situations provokes a better appreciation for handling problems encountered in the daily work environment say two Research Council staff who have just completed a new in-house supervision course.

"The course is well set up and the use of videos brings you as close as you can get to an actual situation," says Steve Tate, Editing and Publications Sales. "The videos also encourage an immediate response."

Participants were asked to contribute real-life situation problems for discussion and Helga Radvanyi-Starr, manager of the Oil Sands Information Centre, says role playing is a good means of presentation.

"Some of these things have happened to me and while I have had the advantage of other courses, I hope I have something to contribute for more junior people," says Helga.

She sees the course as a vehicle for professional development related specifically to the Research Council's work environment and says instructor Wolf Gut from the Human Resources

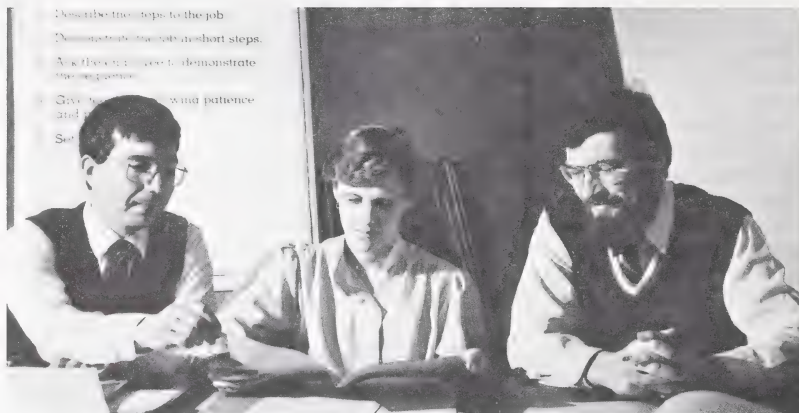
Department "is doing a good job in making the material relevant."

Steve agrees that "it's much more practical than some courses I've been on - I have already applied some of the material in my work."

The six half-day segments, the first of three modules, cover the basic principles of supervision, giving recognition, the hiring interview, setting job standards, teaching a new job and the work progress interview. Another of the 12 participants, Lesley Latimer, Human Resources Department, found the course was broken into "digestible units" and that she learned as much

from the practice sessions as from the written materials.

The same skill units will be offered this month and again in the fall, along with a second level for those who have completed Module A. Wolf says there are still some vacancies for this month's course and anyone interested should contact him in Human Resources. Helga recommends the course to fellow staffers as a step in professional development directly related to the Research Council organization and adds "if you don't take the bull by the horns and educate yourself, you get left behind."



Terry Macyk, Terrain Sciences Department, Margaret Christiansen, Financial Services, and instructor Wolf Gut, Human Resources, go over some of the resource material used in new in-house supervision course.

One for the heart

Have a (healthy) heart.

We have heard about the risk factors, but how do they cause heart disease?

That question and others dealing with coronary artery disease will be discussed under the topic Prevent Heart Disease NOW! at the March Brown Bag Wednesday lunches sponsored by the Occupational Health Unit.

Occupational health nurse Brenda De Jong will describe the difference between a coronary, heart attack, myocardial infarction, coronary thrombus and angina, and the discussion will be followed by a 14 minute film from the Canadian Heart Association.

Bring your lunch and attend the Occupational Health Unit's Brown Bag Wednesday at noon: March 6 - Terrace Plaza; March 13 - Campus; March 20 - Clover Bar; and March 27 - Devon.

Employee changes

We welcome to the Research Council the following: **Leslie Hicks**, Research Technologist, Chemistry; **Maja Hoeing**, Administrative Professional Officer, Human Resources; **Frans Louman**, Research Technologist, Oil Sands Research; **Henry Meng**, Research Officer, Chemistry; and **Debra Ryby**, Clerk Typist, Industrial Development.

We wish the following well in new endeavours: **Claire Burke**, Editing and Publications Sales.

INTERSOL chairman

Former president of the Alberta Research Council, Dr. Gilles Cloutier, is organizing committee chairman of INTERSOL 85, an international congress and exhibition on the theme "Solar energy: the diverse solution" to take place in Montreal in May.

Medical claims:

Staff covered by major medical and dental plans must submit all claims for the 1984 benefit year to Pay and Benefits Section by March 29 in order to receive reimbursement by Northern Life Assurance Company.

**ALBERTA
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Newsline

Facilities update – the shape of things to come

CANADIAN

APR 15 1985

New quarters for the southern regional office in Calgary, a new building for Clover Bar and a revamped building at Red Deer have been approved for the Research Council.

Calgary

Calgary staff will move July 1 to their new facility, 6815 - 8 Street N.E. and the Deerfoot Trail. The Research Council will be located in the same building as a new initiative — the Calgary Advanced Technology Centre — being launched by the Calgary Research and Development Authority.

The Research Council's own Advanced Technologies Department will take up the largest portion of Research Council space to accommodate information technology, automation technology and joint venture research.

The Industrial Development Department (Calgary) will have offices as will Publications Sales. An information centre, to include a branch library and industrial technical information services, will be part of the facility. A large meeting room for up to 100 people plus a smaller meeting room will serve the Research Council and be available to the Calgary Research and Development Authority and to other users, such as professional societies, for evening meetings.

"The Calgary Advanced Technology Centre will be an 'incubator' for high technology entrepreneurs," says Dr. David Mitchell. "The Research Council's close proximity to budding enterprises and our association with the Calgary Research and Development Authority, we hope, will benefit Calgary's growing technological industry."

Clover Bar

At Clover Bar, temporary trailers now in use by the Oil Sands Research Department are to be replaced with a non-laboratory support building containing offices, library, meeting rooms and lunch facility. The provincial government has approved \$750,000 this year for architectural plans and specifications, with another \$5.5 million for construction start slated for 1986.

Approval also has been given for installation this year of air-conditioning in the laboratory building.

Red Deer

Of the two buildings used by Atmospheric Sciences at Red Deer, approval has been granted to purchase and upgrade the two-storey building to supplant the one-storey building. The radar equipment also will be moved to a new site. Design work and site preparation will be completed during the summer months with actual on site work to commence at the end of the summer field season.

Mill Woods

Tenders for outfitting the Electronics Test Centre, located in the west high head laboratory, close April 11. The stipulated contract period from the date of awarding the tender is four months, which means the Test Centre should be ready for occupancy by the end of August.

The Forest Products laboratory in the east high head laboratory has been operating for six months, but the move for the Biotechnology pilot plant in the remainder of the space has fallen behind schedule. Although much of the outfitting is complete, the 2300-litre fermenter is not expected to arrive until later this month.

As for the main building, consulting planner Victor Jackson says "every effort is being made to see that the first occupants can begin moving in during August, with the remainder taking up their new quarters in September and October. Delays in the development of plans for the computer network make it extremely unlikely that anyone will move before these dates."

Sub-contractors for finishing and outfitting the offices and laboratories are ready to move in, but work under the basic contract is a month behind schedule, says Mr. Jackson.

Staff from the Campus building will move first as the University of Alberta would like to occupy that space as soon as possible. The current schedule calls for staff from Terrace Plaza to move next, but the Atmospheric Sciences Department will not move before the end of the summer field season. The Geological Survey, Terrain Sciences and Civil Engineering departments will remain in Terrace Plaza, eventually occupying the sixth and seventh floors.

The Materials and Testing Department at Parsons' warehouse will be among the last to move. Other late moves will be the gravel and ceramics laboratory from 10345 - 69 Avenue, and the ground-water warehouse from 11547 - 160 Street.

Devon

Construction to outfit the high head laboratory is scheduled to begin this fall. The move from the interim facilities at Nisku is currently scheduled for the end of 1985 or early 1986. Actual moving dates will become clearer once outfitting is under way and also may be affected by research program schedules.

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Martin O. Jeffries, Calgary, recipient of the Alberta Research Council scholarship for the past two years, is shown receiving his award from Dr. Mike Kessick, Head of the Research Council's Chemistry Department, during a donors' luncheon held by the University of Calgary. Mr. Jeffries is a post graduate student in glaciology at the University of Calgary.

Roy O. Lindseth honored by SEG

Roy O. Lindseth, Calgary, president of Teknica Resource Development Ltd., and a member of the Research Council's Board of Directors, has received an honorary membership in the Society of Exploration Geophysicists.

The honor was made in recognition of Mr. Lindseth's distinguished contributions to exploration geophysics in data processing software, geologic understanding of seismic data and to the advancement of the profession through continuing education and service to the Society.

The official presentation was made at the SEG annual meeting in Atlanta.

Dr. R. Schnell and *P. syringae*

The Research Council's contract with BIO-FROST INC. for scale-up of ice nucleating bacteria has brought the story of *Pseudomonas syringae* full circle. *P. syringae* is the name of the bacterium found on plant leaf materials which produces the ice-nucleating properties genetic scientists have transformed into a snow and ice-inducer.

Dr. Russell Schnell, Cooperative Institute for Research in Environmental Sciences, University of Colorado, who has devoted much of his research to this area, made his initial findings while working as a student at the Research Council between 1964 and 1970. Dr. Schnell writes:

"In 1969 I was a student working on the Alberta Hail Studies Project in Penhold. While there, I collected some grass from near the airstrip and allowed it to decay. When I tested it, it had a large number of active ice nuclei. Some years later these were identified as *P. syringae*."

Dr. Schnell says this was the original discovery of these ice nucleating bacteria. In 1976, he published a paper showing how the bacteria can be used to make snow in cloud chambers using the same principle that BIO-FROST is using to make snow on ski hills.

Dr. Schnell is a native of Castor, Alberta and a graduate of the University of Alberta. He has since published a number of papers on the subject, some in collaboration with another Canadian scientist, Dr. Gabor Vali, his thesis advisor, now at the University of Wyoming.

Staff news from all over

"Word of our work is spreading through Calgary," says Dr. Mark Fenton, geologist in the Terrain Sciences Department. Mark was asked to address the Coal Group of the Canadian Society of Petroleum Geologists in Calgary last month on the topic "Is Glacial Thrusting Important to Coal Development."

"My talk was a sequel to one given by Dennis Nikols of TransAlta Utilities Corporation on the work we both have been doing for TransAlta at Highvale Mine," says Mark. "As a result of Dennis' discussion of the geology of the mine and the mine itself, I was asked to give a presentation on the problems of highwall stability in developing coal mines where glacial thrusting occurs."

★ ★ ★

Dr. Marianne English, Atmospheric Sciences Department, has been appointed to a scientific review panel for the U.S. National Center for Atmospheric Research (NCAR) convective storms division. Dr. English is the only Canadian on the panel which met in Boulder, Colorado, in February.

★ ★ ★

Andy Bosman, Geological Survey Department, has been cited for his contribution as lecturer to the NAIT Earth Resources Program over the past three years.

"The presence of an organization like the Alberta Research Council in the community is a great resource for all those interested in the earth sciences and from our point of view, Mr. Bosman's expertise has proven to be an important part of that resource," writes Larry Rindero, instructor, in a letter of appreciation to Dr. E.A. Babcock, vice-president of the Natural Resources Division. "As a guest speaker in my exploration course (Mr. Bosman) has greatly enhanced the students' understanding of shallow drilling techniques and applications."

★ ★ ★

Dr. Birbal Singh, of the mathematics modelling group, Oil Sands Research Department, has been appointed to the Edmonton Public Library Board for a three-year term. The nine-member board, appointed by city council, administers an annual \$14-million budget.

★ ★ ★

Nearly 200 soil scientists from government and industry attended the annual Alberta Soil Science Workshop held in Lethbridge. Bob Howitt, Bob MacMillan and Dr. Larry Turchenek, Terrain Sciences Department, were authors of papers presented during the sessions.

Biotechnology key to plant breeding problems

The new world of biotechnology may hold the answer to a century-old problem for plant breeders — how to improve cold hardiness in winter wheat.

Dr. Tony Chen and Dr. Mark Lazar have embarked on a three-year investigation aimed at applying recently developed plant cell culture technologies for enhancing genetic variability and improving selection for winter wheat hardiness. Their research, in its second year, is being supported by an annual \$58,000 contract from the National Research Council's Plant Biotechnology Institute.

Winter wheat has many advantages for the farmer, among them better yields and earlier maturity than spring wheat; more efficient use of early spring moistures and the protection of soil from erosion. However, winter wheat seedlings must cope with the extremely low freezing temperatures during winter. Winterkill is the single most limiting factor affecting Canadian winter wheat production.

Despite decades of plant breeding research in the western prairies, progress has been slow. Large improvements in cold hardiness are unlikely without new sources of genetic variability, according to Dr. Chen and Dr. Lazar.

"From a practical point of view," says Dr. Lazar, "even a small improvement in cold hardiness character would reduce the risk of winter damage in most winter wheat production areas."



Technologist Rosemary Ravindra separates plant embryos produced from tissue culture.

The ultimate aim is to develop a new variety of seeds which can withstand the more severe climatic conditions in northern Canada and the United States.

The key lies in genetic variability, essential to any plant breeding program and the trick for biotechnology researchers is to untangle the complex genetic makeup in plants and their interaction with environmental conditions.

In the Research Council's laboratories, Dr. Chen and Dr. Lazar are attacking the problem on two simultaneous fronts. Because plants produced through tissue culture often contain natural changes which may be exploited as new sources of variation, the scientists are concentrating on creating a genetically variable population of plants from this technique, using plant cell tissue from the best available cold hardy wheat.

"Part of the attractiveness of this technique is the fact you can grow up to 100 plants from a single tissue," says Dr. Lazar.

Tiny portions of the immature flower from a plant placed in a culture produce callus which regenerate as a new seedling. Some callus is being subjected to freezing in a liquid nitrogen for various periods of time up to one month before being thawed for regrowth followed by plant regeneration.

Plants regenerated from callus recovered from freeze-preservation, or selected hardy plants will be grown to maturity and the self-pollinated seeds harvested for further evaluation.

At the same time, using plant growth chambers, the research team is simulating the fall conditions of decreasing temperatures and daylight to study how well plants survive at the lowest temperatures, the length of time they can survive in cold temperatures, the effectiveness of cold hardening and how well they can survive chinook conditions.

"We are using ordinary wheat plants with the best cold tolerance now available to establish simulation for all these conditions," says Dr. Lazar. "Eventually we will put the regenerated plant seedlings from our tissue cultures through the same cold hardening process as well as those which have been subjected to cryobiological (freeze-preservation) techniques. Each step provides us with selection based on survival."

For all its hardy properties, today's winter wheat has limitations, and its successful cultivation is restricted by lack of snow cover in much of southern Alberta and by the cold climate in the northern half of the province. If the experiments being carried out in the Research Council's biotechnology department prove successful, the results could be the basis for a new cold hardy strain which would one day give more Alberta farmers the option to plant winter wheat crops.

Readership survey: We want to hear from you!

As a publication for employees of the Research Council, Newsline's primary function is to keep you informed about the organization and the people who work here.

We would like to know if Newsline is meeting your needs and what you think of the newsletter. Where can we change and improve?

Later this month you will be receiving a questionnaire designed to quantitatively determine the current strengths and weaknesses of Newsline as a means of communication within the Research Council. Although Newsline also has an external distri-

bution, the questionnaire is solely for Research Council staff. The questionnaire should reach you by April 23. If you have not received yours by April 26 contact Brenda Coulombe, Public Relations, 438-1666 ext. 308.

Your answers will be confidential. The results of the survey will be published in the August issue of Newsline.

The future direction of Newsline will be influenced by your opinions. Help us to improve and grow into a better publication reflecting your interests and needs.



Marcel Polikar and Brian Fuhr brown bag it at Clover Bar as occupational health nurses Stephanie Wilson and Brenda DeJong get ready to give their presentation.

Nutrition topic

You are what you eat according to the old maxim, and the Occupational Health Unit will tackle Nutrition and Your Health in its April Brown Bag lunch series.

Two graduating students from the University of Alberta School of Home Economics will be guest speakers for the first two presentations. Shelley Hironaka will discuss Carbohydrates and the Athlete April 3 in the 6th floor conference room, Terrace Plaza. Marlene Leong will give the April 10 presentation Sodium and Hypertension in the Campus Building conference room.

Topics for Clover Bar on April 17 and Devon on April 24 are to be announced and staff are asked to watch for the posters.

All lectures will start at 12 noon.

STEP application deadline April 15

Application forms for the 1985 Summer Temporary Employment Program (STEP) are now available in the Human Resources Department. Department Heads, project leaders and supervisors are reminded the deadline date for submitting applications is April 15.

The Alberta Government has initiated a new Alberta Youth and Training Program which may provide salary subsidy of up to \$7,800 per annum if

the funds are used to hire Alberta post-secondary graduates (university and/or technical school), who have graduated in the previous 12 month period and who have been unemployed or underemployed for at least four months. Applications are accepted year-round.

For information and application forms regarding these programs, contact Joan Cartmell in the Human Resources Department, 438-1666.

Team up for fun and fitness

Are you agile enough for the Bureaucratic Shuffle? Can you overcome the Better Business Obstacle Course or do the Executive Strut?

These events and others, including the six kilometre run, target toss and pass the buck relay, are part of the Edmonton Corporate Challenge to be held Saturday, June 1, from 8 a.m. to 4 p.m. at the Universiade Pavilion.

The Edmonton Challenge is an annual fun and fitness day developed to encourage participation among management and employees throughout the Edmonton area.

The Research Council is allowed two teams of up to 15 members each, five of whom must be female. Alberta Research Council T-shirts will be provided to participants.

The entry deadline is May 10 and the Occupational Health Unit will put up the \$100 per team entry fee. If you are interested in taking part, contact Stephanie Wilson, Brenda DeJong or Jan Logan at the Occupational Health Unit (438-1666).

Now that spring is here, don't vegetate — get out and participate!

Employee changes

We welcome the following to the Research Council: **Terry Cox**, Research Officer, Computing; **Jim Dardis**, Research Officer, Coal Research; **Rose Filax**, Clerk Typist, Coal Research; **Robert Growcock**, Research Technologist, Electronics Test Centre; **Richard Parker**, Research Officer, Coal Research; **Yiu-Wing Tam**, Research Officer, Advanced Technologies.

We wish the following well in new endeavours: **Richard Buck**, Graphic Services; **Richard Finley**, Industrial Development; **Lorne Green**, Coal Research; **Rita Hay**, Oil Sands Research; **Harriet Judge**, Industrial Development; **Roger Klemm**, Chemistry; **Walter Krause**, Oil Sands Research; **Brenda Leskiw**, Facilities Management; **June Liebrecht**, Records Management; **Robin McDaniel**, Financial Services; **Shirley Morton**, Human Resources; **Katherine Pattison**, Materials and Testing; **David Rogers**, Atmospheric Sciences; **Joanne Rose**, Editing; **Ronald Strivens**, Materials and Testing; **Edward Wallick**, Terrain Sciences.

**ALBERTA
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Newsline

CANADIANA

MAY - 7 1985

Soil erosion model being developed

Despite the portrayal of our agricultural lands as a rich, renewable resource, there is growing concern over the extent of soil degradation occurring in all regions of the country, and the consequently declining productivity. For example, it is estimated, at 1982 prices, that it would cost prairie farmers \$239 million in fertilizer to fully recover the present loss of grain production from wind and water erosion.

Rain, wind, soil type, farming practices - all have an impact on the landscape and the productivity of our soils. Soil erosion can remove many of the nutrients needed for crop growth. It can reduce the volume of topsoil and remove fine-grained soil particles and soil organic matter, reducing the capability of the soil to support plant growth.

Efforts are being made to combat soil degradation. One project, initiated last year by the Research Council with joint funding from Farming for the Future, is being carried out in east central Alberta where soil erosion is a persistent problem.

Project leader Bob Howitt, Terrain Sciences Department, said that last year he measured topsoil losses through erosion, ranging from 20 to 110 kilograms of soil per square metre which translates to depths ranging from two to 10 cm. In small depressions topsoil had accumulated to



Technologist Brenda Sawyer and project leader Bob Howitt test new technological tool to be installed this summer for gathering data on soil erosion.

depths of 45 cm, a great deal of that from soil erosion.

This month, he will be installing six electronic data gathering systems in the counties of Two Hills and Beaver. The

new technological aid acts as a remote data acquisition system, monitoring rainfall, wind speed and direction, incoming solar radiation, soil temperature, relative humidity and air temperature.

"The goal of the five-year project is to develop a model that describes the process of erosion in the field and what occurs under given circumstances," says Bob. "Our chosen study areas are representative of much larger areas throughout Alberta and the results should give us a better understanding of soil erosion."

Electronic data gathering is one step in the preparation of such a model. Alberta Agriculture "sees the need for this research and is encouraging our studies to provide them with tools for assessing erosion," he says. "Such forecasting data will also be useful in showing farmers current and long-term effects from erosion."

The project also is providing the framework for Bob's doctorate studies.



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**ALBERTA
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Dr. Newbould appointed to board

Dr. Ian D.C. Newbould, Director of Research, University of Lethbridge, has been appointed to the Board of Directors of the Alberta Research Council for a three-year term.

As Research Director, Dr. Newbould is responsible for the administration of all external research grants and contracts to the University of Lethbridge. He holds a mandate to develop policy recommendations with regard to research partnerships beyond campus precincts, with special emphasis on applied research and technology transfer. Dr. Newbould also is associate professor in the Department of History.

Dr. Newbould is a graduate of the University of Guelph and received his Ph.D. from the University of Manchester where he studied on a postgraduate Research Scholarship. Since joining the University of Lethbridge in 1973, he has been the recipient of a number of Canada Council, University of Lethbridge research grants and Social Sciences and Humanities Research Council of Canada general grants. In 1979-80 he was elected to a visiting fellowship, Wolfson College, Oxford.



Dr. Toshi Kaneda with two new visiting scientists to his microbiology laboratory, Dr. Kanichi Ichihara, lipid specialist, and Hiroyuki Hosoya, plasmid specialist.

Plasmid, lipid specialists join Dr. Kaneda's laboratory

"Newcomers always bring fresh and new ideas," says Dr. Toshi Kaneda, Research Fellow, whose microbiology laboratory has attracted nearly 20 visiting scientists from all over the world over the last 25 years.

One of two current visiting scientists is Hiroyuki Hosoya, plasmid specialist at the Fermentation Research Institution in Tabuka. The other is Dr. Kanichi Ichihara, a lipid specialist at Kyoto Prefectural University in Kyoto. They have joined Dr. Kaneda to study the genetic manipulation of lipids in bacteria.

Dr. Kaneda's group for many years has been studying an unusual lipid system which only occurs in certain bacteria.

The lipid system contributes to low temperature characteristics of the bacteria. The research group wants to discover the basic properties of the lipid system to understand how it might be used to improve the performance (or growth) of crop plants in cold climates.

Two other visiting scientists in the microbiology laboratory are returning to their respective campuses after studying the purification and properties of two enzymes involved in the degradation of a model compound of Athabaskan bitumen by a bacterium.

Dr. Hitoshi Obata was on a year's sabbatical leave from Kansai University, Osaka, and Anna Bonga is a co-operative student completing her B.Sc. in biochemistry at Simon Fraser University.

Oil sands research technologist Eva Miles-Dixon demonstrates the department's xeroradiography to three members of a Chinese delegation touring the Oil Sands Research Department. From left are Ma Yu Long, deputy director, Exploration and Development, Research Institute, Deng Lirang, president, and Ding Feng, Foreign Affairs Department, all of the Liaohe Oilfield.



Sample bank has international scope

Dean Wallace will be wearing two "hats" when he addresses a Chemistry Institute of Canada (C.I.C.) workshop at the University of Alberta this month. At the C.I.C.'s Sampling Workshop, one hat will be as active participant, the other as graduate student in analytical chemistry.

As project manager for the Research Council's Oil Sands Sample Bank, Dean has encountered sampling and analytical problems due to the widely varying characteristics of oil sands. In fact, those problems sparked his interest in further study in the field.

The interest is natural. In developing equipment and processes for use in the Alberta oil sands, researchers have required sample material for testing purposes. Their requests are generally referred to the Sample Bank. Funded by the Alberta Oil Sands Technology and Research Authority (AOSTRA), and operated on a cost-recovery basis as a service to industry, the sample bank annually fills between 150 and 200 orders. The orders come from all parts of the world, from schools, universities, research agencies and private companies.

"We stock oil sands, and between 20 and 30 additional products related at all stages of the extraction and recovery process," says Dean, who operates the bank with the assistance of samples analyst, Deb Henry.

The sample bank ships approximately 150 tonnes of material per year - to fill orders for everything from a bucketful of bitumen to a multi-tonne load of raw sand. As part of the service, shipments are accompanied by an appropriate history and analytical data so that recipients "know what they're starting with."

As a measure of the worldwide interest generated by the Alberta resource, the bank has recently shipped sand to a New Mexico firm interested in new extraction methods, bitumen to Japanese researchers working on upgrading technology, and limestone (blasted from a deposit near Fort MacKay) to a company in Finland doing research on fuels for use in Alberta oil sands plants.

"The advantage for the client is that we have the material here and can ship it quickly. The advantage for the oil sands companies is that they don't have to interrupt the operation to han-

dle dozens of requests annually."

Although the sample bank works closely with virtually all oil companies, its major suppliers include the Suncor and Syncrude plants in the Athabasca deposit and the Esso and Husky operations at Cold Lake and Lloydminster respectively.

Two huge outdoor freezers at the Clover Bar research facilities can accommodate 200 tonnes of samples. Acquiring the 25 tonnes of oil sand stockpiled (to preserve its freshness) generally involves a one-day-a-year exercise with a front-end loader at the supplier's site. But some requests spark

more drastic measures.

Dean recalls one order from a piloting group for special sand found only in the Grand Rapids area west of Fort McMurray.

"We were flown in by helicopter and cut a landing site in the bush near the spot where we drilled core holes in the cliff face for dynamiting. Then we had to carry five tonnes of sand by hand back to the helicopter. It took two days and I swear my arms were five inches longer when we finished."

Helicopter carries out samples of sand from remote site in northern Alberta.



Readership survey Let's hear from everyone!

May we have the envelope please - with your completed questionnaire enclosed.

By now you have received your copy of the Newline readership survey sent to all staff in April. If you have not already done so, we hope you will take a few minutes to complete the ques-

tionnaire and return it to the Public Relations office by May 10.

The future direction of Newline will be influenced by your opinions. Let us know what you think and help Newline become a better means of communication.



Dr. Michael Kessick



Dr. Alan Sanger

Dr. Mike Kessick and Dr. Alan Sanger, Chemistry Department, have been elected as Fellows to the Chemical Institute of Canada in recognition of their achievements and service to their profession. Their certificates will be presented at the 68th Canadian chemical conference and exhibition in Kingston, Ontario June 2-5.

Staff news from all over

The Research Council and the University of Alberta jointly sponsored visiting speaker Dr. Robin Whyman of the New Science Group, Imperial Chemical Industries, England in his presentation "Homogeneously Catalyzed Syngas Chemistry - Promoter Effects." A distinguished researcher in spectroscopy and catalysis, Dr. Whyman is on research leave at the University of Toronto. His visit to Edmonton and the University of Calgary was part of a western tour.

★ ★ ★

Rick Barlow and Frank Robitaille of the Atmospheric Sciences Department collaborated with Norman Thayer, University of Calgary, to complete a paper on "winter precipitation, snowpack and atmospheric conditions in the southern Canadian Rockies", presented at a Snow Property Measurement workshop held at Lake Louise last month.

More than 50 snow physicists, hydrologists, meteorologists and other researchers from Canada, the United States and Japan attended the three-day forum organized by the National Research Council's snow and ice sub-committee.

★ ★ ★

Technology Transfer will be the subject of an address by Dr. Robert W. Stewart at the Association of Professional Engineers, Geologists and Geophysicists of Alberta annual convention being held June 6-8 in Edmonton. Theme of the program is "Innovation and Opportunity in a Changing Environment."

★ ★ ★

The Research Council's Board of Directors will hold a meeting in Fort McMurray May 17. Senior representatives from Suncor Incorporated, Syncrude Canada Ltd. and Texaco Canada Resources Ltd. will attend a luncheon hosted by the Research Council, and the board will tour Texaco's oil sands pilot plant operation.

★ ★ ★

Dr. J. Malcolm Oades, Waite Agricultural Research Institute, University of Adelaide, Australia, addressed a joint seminar for Research Council and University of Alberta scientists and students. His topic was "Structural Stability of Tilled Soils."

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The Professional Staff Association semi-annual general meeting is scheduled for May 29 at 3 p.m. in Terrace Plaza.

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The Research Council is the recipient of the United Way employee bronze award for its 1984 contribution to the support of the United Way. Joan Checholik, Geological Survey Department, who chaired our employee campaign, accepted the award at the annual canvassers' dinner.

★ ★ ★

Peter Williams has won the Canadian Electrical Association's 1984 Research and Development award in recognition of valued services and contributions to the association. Peter recently transferred to the Applied Sciences Division from the Industrial and Engineering Research Division.

Employee changes

We welcome the following to the Research Council: **Brian Bodley**, Research Technologist, Electronics Test Centre; **Maurice Engler**, Research Officer, Advanced Technologies; **Sarah Gallazin**, Executive Secretary, Industrial and

Engineering Research.

We wish the following well in new endeavours: **Jennifer Barriskill**, Library; **Peter Flach**, Geology; **Robert Du Wors**, Advanced Technologies.

**ALBERTA
RESEARCH
COUNCIL**

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Volume 6, number 6

Newsline

June 1985

Appointments announced

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Dr. Robert Humphries



Dr. Zdenek Vintr

The Board of Directors approved on May 17 the appointments of Dr. Robert Humphries as Head of the Atmospheric Sciences Department, and Dr. Zdenek Vintr as Director of the Computing Department.

Dr. Humphries assumes the position of Head of the Atmospheric Sciences Department (ASD) after serving nearly two years as Acting Head. He is also project manager of the Research Council/Nortech and Research Council/Intera joint research ventures and a consultant to Raytheon Company on the Next Generation of Weather Radar (NEXRAD) being developed for the United States government.

He holds an M.Sc. in Nuclear Physics from the University of Alberta and a Ph.D. in meteorology from McGill University. Before joining the Research Council in 1974, he spent several months at the Canadian Atmospheric Environment Service on a

National Research Council Postdoctoral Fellowship. In 1981, Dr. Humphries was awarded the Andrew Thomson Prize in Applied Meteorology by the Canadian Meteorological and Oceanographic Society in recognition of his excellent contribution to the development of techniques for detecting severe weather conditions and for visual presentation of weather radar data.

Dr. Vintr joins the Research Council after eight years with the British Columbia Systems Corporation in Victoria.

A native of Czechoslovakia, Dr. Vintr holds a degree in mathematics and physics from the University of Prague. For 20 years he specialized in nuclear physics research, nuclear reactor physics, neutron physics, structure of atomic nuclei, all with extensive use of computers.

He came to Canada in 1965 and in

1967, joined the Laboratory of Nuclear Physics, University of Montreal as systems physicist. Subsequently, he has been responsible for developments in a variety of computer-related projects for such organizations as Multiple Access Control Limited, Toronto; Control Data Corporation, and the Canada Systems Group, Mississauga, Ont.

Dr. Vintr held a senior position in the British Columbia Systems Corporation, with responsibility for strategic planning and implementation of information technology for the B.C. government.

Basin analysis group completes major studies

When the Second Annual Canadian/American Conference on Hydrogeology convenes in Banff June 25-29, delegates will be discussing a topic of major concern throughout North America - hazardous wastes in groundwater.

The conference is being sponsored jointly by the Alberta Research Council and the National Water Well Association.

"Protection of our aquifers and safe, efficient management of our waste disposal operations have become the most absorbing activity for the majority of hydrogeologists in both our countries," says Dr. Brian Hitchon, Research Fellow and one of the principal organizers of the Banff sessions.

Dr. Hitchon heads the Research
Continued on page 2

Newsline is a monthly publication for the employees of the Alberta Research Council

Please send all submissions and direct all questions to Elizabeth Page, Alberta Research Council, 7th Floor, Terrace Plaza, 4445 Calgary Trail South, Edmonton, Alberta T6H 5R7

ALBERTA RESEARCH COUNCIL

Continued from page 1

Council's Basin Analysis Group which recently completed two major Alberta hydrogeological studies - The Hydrogeology of the Cold Lake area, and An assessment of fluid-rock interaction as related to subsurface waste disposal in oil sands and heavy oil areas of Alberta and adjacent areas.

The six-volume \$1 million Cold Lake study, funded jointly by the Research Council and Alberta Environment, includes an impressive atlas containing 220 maps and the development of a database management system for handling hydrogeological data.

The Cold Lake project took two and a half years to complete, but now, says Dr. Hitchon, "with this database and the software we developed, if we had to do it over, we could finish the work in a quarter of the time."

Not only that, the set of programs is applicable anywhere in Alberta and in a modified form, can be used in Saskatchewan and the Beaufort-Mackenzie Basin.

The assessment of fluid-rock interaction in oil sands and heavy oil areas was prepared for the Environmental Protection Service, Environment Canada with funds provided through the inter-departmental panel on energy research and development.

Dr. Hitchon says it is important to understand the baseline hydrogeology, that is the pattern and distribution of underground fluid movement, and to point out the constraints to deep waste disposal.

"We must avoid contamination of potable water resources, and other potential economic resources such as calcium and magnesium in formation waters."

It is equally important to know what chemicals injected waters contain and their possible reactions with the subsurface water.

Of real concern to hydrogeologists is the underground route such injected water can travel. Researchers who worked on the Cold Lake study ascertained that high volumes of injected water will create a plume outside their model area, and may reach across the provincial border into Saskatchewan. Fracturing of the injection rock is also a possibility.

"These are two of the aspects being considered in follow-up work, which is also jointly funded by the Research Council and Alberta Environment," notes Dr. Hitchon.

With reference to another study of

14,575 square kilometres in the Swan Hills area, Dr. Hitchon says "we know that injected wastes will move underground, and it is our job to recommend the best rock unit for injection which causes the minimal environmental disruption."

He noted that "every effort is being

made to understand the baseline hydrogeology and how the injected waters will move and react in underground environment."

"Using every piece of information available, the Swan Hills study will be the most comprehensive of which we are capable."

Microchip facilities - proposal wins support

A proposal by a committee chaired by Dr. Brian Barge, Alberta Research Council for the establishment of microchip design and fabrication facilities in the province has received formal government support with an announcement by Hon. Hugh Planche, Minister for Economic Development.

In a statement to the Alberta Legislature in April, Mr. Planche said a microchip design centre will be located at the University of Calgary and a fabrication facility will be established at the University of Alberta, with both facilities managed by the Alberta Microelectronics Centre.

The announcement, which carries a provincial government commitment of \$13 million over the next three years, is the fruit of many hours of work by a cooperating committee headed by Dr. Brian Barge, Head of the Research Council's Advanced Technologies Department.

At an exploratory meeting arranged by Board member Dr. Gordin Kaplan, Vice-President, Research at the

University of Alberta, the Research Council agreed to act as facilitator in drawing up a proposal and plan for microchip facilities in Alberta. Dr. Barge was chairman of both the original microelectronics steering committee and the cooperating committee.

The proposal that both the universities of Alberta and Calgary participate in design and fabrication of microchips through the Alberta Microelectronics Centre is one of the first proclaimed cooperative ventures of its kind, says Dr. David Mitchell, Vice-President. The proposal also was approved in principle by the Board of Directors of the Alberta Microelectronics Centre.

"We believe none of this would have happened without the committee," says Dr. Mitchell. "Such design and fabrication facilities will provide appropriate infrastructure to enhance the development of high technology in the province and encourage diversification of the economy."



The armoured T-28 hail research aircraft from the Institute of Atmospheric Sciences, South Dakota School of Mines and Technology, will join the Research Council's hail research field program at Red Deer this month. With modifications to allow it to fly directly into thunderstorms, the T-28 has made more than 200 such penetrations since 1972, and has been an important data gathering facility for the National Hail Research Experiment in the United States.

CAD streamlines assistance

A computer-aided drafting system is streamlining a plant design assistance program offered to small- and medium-sized businesses by the Industrial Development Department.

According to Lou Beres, the industrial engineer who uses the computer to help companies design or redesign their industrial plants for maximum efficiency, automation has come just in time to help him keep up with a growing number of requests for the department's services.

"I don't know whether this reflects a new mood of business confidence or whether it is the result of some Research Council personnel relocating to Calgary. Or it may be in response to the Research Council's recent advertising campaign. But industrial enquiries have more than doubled compared to last year. Then I was receiving about 22 enquiries a month. Now it averages 55."

Lou, who admits he had "never laid hands" on a computer until he began training to operate the IBM PC complete with its AUTOCAD software package, says: "I now can't wait to get my hands on it."

Currently working on his fifth plant layout project since the system was installed last September, he notes: "We have already done as many projects this year as we did in all of 1984."

The computer makes it possible to complete a design or redesign a project in a few days - "using manual methods, these projects could take up to three weeks."

The system is used to first draw plant outlines, then to draw the outlines of each piece of equipment to be accommodated.

"This is the most time consuming part. Once I have both these layers of information I can move the machines around in a matter of seconds in order to create a new material flow diagram, for example. Or I can zoom in for a close-up look at any individual machine. Changes like this would mean hours of redrawing at the conventional drawing board."

Recent projects include a plant layout for a textile manufacturer and new plant design for a manufacturer of TV satellite "dishes". "Designing a layout for a new plant is always more complex than a redesign. But in either case the objective is to come up with the best and most effective way to

place the equipment."

Clients are invariably impressed with the professional quality of the computer-produced drawings, he says, adding that the designs are offered as suggestions only. "If the client wishes to make changes and has access to a

computer, we will even supply them with the disk so the work can be done by computer."

He hopes in future to set up an industrial engineering library containing the outline of "every industrial engineering assembly in standard use."



Debbie Ryby at the printer as Lou Beres operates the Industrial Development Department's computer aided drafting system.

Science Fair

A Biotechnology Special Award for presentation at the Edmonton Regional Science Fair has been initiated this year by the Research Council.

Dr. Don Gerson, Head of the Biotechnology Department, presented the first award to the winners of the 1985 competition, Kenneth Orbeck and Jim Rutkowski, Grade 9 students at McKernan School. Their prize-winning project was entitled, "Determining the effects of pH on Algae." Michelle Dechaine, Grade 7, John-Paul II School, received honorable mention for her project, "How Does Sugar Affect Yeast."

The Alberta Research Council Earth Sciences Award was won by John-Paul Hargrove, Grade 9, McKernan School,

for his project: "Conduction in Soils: Have Heat, Will Travel." Grant Akins, Grade 5, Meridian Heights School, received honorable mention for his project, "Soil retention of water."

Research Council staff once again played an active role in judging during the two-day fair which is open to elementary, junior and senior high school students. Taking part as judges were: Ed Bertram, Materials and Testing; Don Gerson, Biotechnology; Renee Elio, Computing; John Godfrey, Geological Survey; Guy Goyer, Bob Humphries, Bob Kochtubajda and Leslie Stovel, Atmospheric Sciences; Marcel Polikar, Oil Sands; Alan Sanger, Chemistry.

Staff notes from all over

Dr. Robert W. Stewart, President, has been appointed an Honorary Professor of Science to the University of Alberta.

The life appointment is bestowed on senior internationally distinguished scholars. Dr. Stewart is only the second scientist to receive this honor from the university.

★ ★ ★

John Holub, Head of the Industrial Engineering Department, addressed a workshop on Technology for Small and Medium Business Enterprises held in Lahore, Pakistan, in April. The workshop was the first in a series and was organized by the International Development Research Centre in collaboration with the Pakistani Council of Scientific and Industrial Research.

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Dr. Petre Toma, Oil Sands Research Department, was a session chairman at the third European meeting on improved oil recovery held in Rome in April.

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Michael Werb, Industrial Development Department, was guest speaker before a class of business students at Wilfred Laurier University, Waterloo, Ont.

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Major L.A. Sundy, Canadian Forces Base, Edmonton, has expressed appreciation for the cooperation of the Research Council staff in the petroleum laboratory, particularly Brian Rebus, chemist, Rick Salyzyn and Neal Dressler, technologists, for assisting CFB Edmonton in a fuel analysis following a recent accident at the base.

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In the sporting life ... the Research Council has two teams in a newly formed slow-pitch city league, and more participants are welcome. Anyone interested should contact Doug Boisvert (438-0555, ext. 206)

or Brenda Morgan (438-1666 ext. 238).

And wrapping up the hockey season in the annual spring challenge, here are the final results: Clover Bar vs. Nisku, 9-4; Nisku vs. Terrace, 5-4; and Terrace vs. Clover Bar, 6-1.

★ ★ ★

Thank you ... to all those who took the time to fill out the Newline readership questionnaire. We will let you know the results later this summer.

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Andy Bosman, Terrain Sciences Department, is the author of a feature article on the Research Council's coal drilling program which appeared in the April issue of the Canadian Mining Journal.

★ ★ ★

Fifty-seven Research Council scientists have responded to a request to list their names with the Science Information Sources (SIS). The SIS, organized by the Canadian Science Writers Association, is a database of Canadian scientists to whom the media can refer for information and interviews, including those at the University of Alberta and the University of Calgary. Any Research Council scientist who wishes to be listed with SIS may call Dorothy Hollands, Corporate Secretary and Director of Public Relations.

★ ★ ★

Stephanie Wilson, the Research Council's occupational health nurse, will represent the Alberta Occupational Health Nurses Association (AOHNA) as its candidate to a national conference in October. Stephanie received an \$800 travel grant from the AOHNA as the most qualified candidate for her involvement with Provincial Executive of the Association's North Central Chapter, and other occupational health nursing committees.

Medical Insurance

Northern Life Assurance Corporation has raised its premiums for Major Medical Insurance by 40 percent. Claims the company has paid in recent years have exceeded the premiums collected, resulting in a significant deficit. To balance the books, the Alberta Research Council and staff covered by this insurance will each pay the following increased premiums: from \$1.32 to \$1.85 per month for single coverage; from \$4.26 to \$5.96 per month for family coverage. This change is effective June 1st, 1985 and will be reflected on your June month end pay cheque.

Mill Woods update

The contract for the Biotechnology Pilot Plant is complete and user's equipment is ready to be connected.

In the main laboratories and office building, laboratory area 3 (west) has been taken over from the general contractor and outfitting is under way with a target completion date of July 15. Outfitting of laboratory area 4 (centre) also is expected to be under way by June 1, with a completion date set for September 23.

Camwil Contracting Ltd. has been awarded the contract for outfitting the Electronics Test Centre in high head lab No. 1.

Victor Jackson, consultant for facilities planning, reported to the Research Council's Board of Directors May 17 that a May 1 review of all existing contracts and allowances for anticipated work shows that projected completion costs remain within the approved reduced budget of \$62 million.

Employee changes

Good wishes to the following people in their new endeavours: **Dileep Kumar**, Oil Sands Research; **Wendy MacQuarrie**, Industrial Development; **Rosemary Ravindra**, Biotechnology; **Krista-June Soderlind**, Coal Research; **Frank Tuck**, Editing and Publications Sales.

**ALBERTA
RESEARCH
COUNCIL**

Newsline

New department heads named



Dr. Jan Boon



Dr. Duke du Plessis



Gary Martin

Dr. Robert W. Stewart has announced the appointment of Dr. Jan A. Boon as Head of the Geological Survey Department, and in an exchange move, Dr. M.P. (Duke) du Plessis, as Head of the Oil Sands Research Department, and Mr. Gary Martin, Head of the Coal Research Department. All appointments became effective July 1.

Dr. Boon joined the Research Council in 1976 as an associate research officer in the Oil Sands Research Department and for the past five years has been manager of the Fundamental Research Section.

He graduated with distinction from the University of Utrecht with a B.Sc. in chemistry and an M.Sc. in solid state chemistry and geochemistry with soil science. He received his Ph.D. in geochemistry in 1971 from the Universities of Manchester and Utrecht in a joint venture. His awards include a Dutch Ministry Education Scholar-

ship, the Unilever Award for Chemistry, a British Council Scholarship and a ZWO Grant (Dutch equivalent of NSERC).

Before joining the Research Council, Dr. Boon held positions as research associate, Department of Geology at the University of Windsor, and associate professor at the Universidad de Oriente, Cumana, Venezuela.

He is a member of the editorial board, AOSTRA Technical Handbook and associate editor, Applied Geochemistry.

Dr. du Plessis joined the Research Council in 1979, with responsibility for implementing a new coal research program. He has more than 30 years experience in coal research and consulting, including a teaching post at Concordia University, Montreal, as professor and chairman, Department of Mechanical Engineering; manager of coal conversion and hydrocarbon

technology, Shawinigan Engineering, Calgary, and process engineer, SASOL, South Africa. He also spent nine years as senior process engineer with Cities Service Athabasca Inc., Edmonton, working on the design and operation of an oil sands extraction pilot plant.

Dr. du Plessis holds a B.Sc. in chemistry from Potchefstroom University, South Africa, and in chemical engineering from the University of Natal, Durban, South Africa; an M.Sc. in chemical engineering from the University of Natal, and a Ph.D. in Engineering from the University of Alberta. He is a registered professional engineer in Alberta, Saskatchewan and Quebec and has been granted three patents for oil sands extraction.

Mr. Martin joined the Research Council in 1974 as a project manager, successfully building and directing a

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**ALBERTA
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Mill Woods - shaping up

Staff moves to Mill Woods will not begin before September, says Victor Jackson, facilities consultant.

He anticipates "major portions of the building should be available in September," but the completion has been hampered by delays in receipt of some materials and negative tests for some of the laboratory equipment. Systems testing also has yet to be con-

ducted - "the building is like a ship - we need to conduct the trial run and these are sophisticated control systems."

Construction at Mill Woods is heading into the home stretch, but with the exception of the east pilot plant occupied by the Biotechnology Department and Forest Products, no other part of the building has been turned over to the Research Council.

Therefore, staff are requested to refrain from unauthorized visits to the site since visitors without written permission are not covered by accident insurance, and visitors could be claimed to be obstructing the contractor.

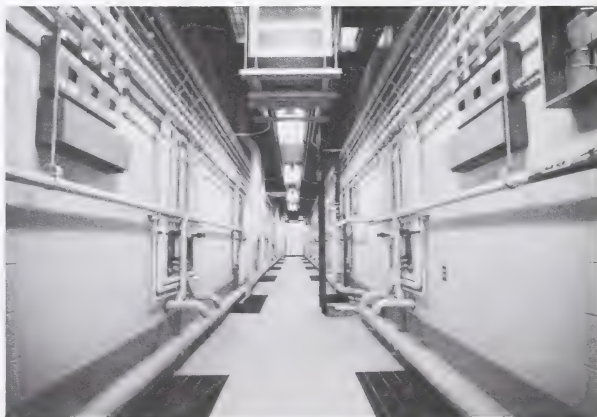
Anyone wishing to visit the site should make arrangements with Victor Jackson or Doug Wilson (438-1666, ext.254).



West atrium



Fermentors in Biotechnology pilot plant



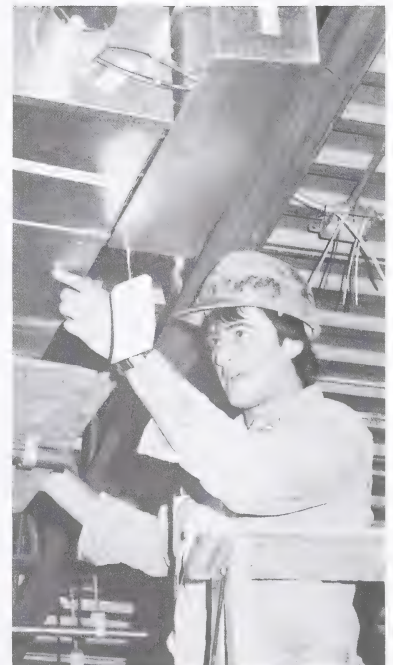
Service corridor



Main spine skylight



Checking building monitoring system



Installing air handling system in computer room

Dr. Guy Goyer investigates damaging lightning

(This is the first in a series of profiles on the Research Fellows of the Alberta Research Council).

Anyone who has watched lightning zigzagging across the sky can appreciate the enormity of the task Dr. Guy Goyer has set for himself in attempting to define damaging lightning and build a numerical model of storm motion.

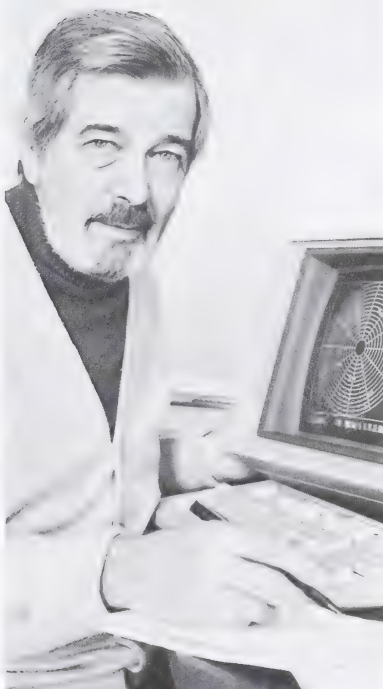
"Storms merge, split and change direction and no two storms are alike," says Dr. Goyer, who began a lightning forecasting project in 1982 for the Canadian Electrical Association (CEA). Lightning storms pose a potential hazard to utility companies' transmission networks and the CEA is funding the research to determine the feasibility of using radar observations to forecast damaging lightning.

In the first phase of the study, Dr. Goyer used historical radar, lightning and outage data to develop a procedure for forecasting damaging lightning in space and time. This spring he received further funding from the CEA to continue with the second phase of the project - to use real time data of lightning directions and of radar to make forecasts in real time.

Standing on the threshold of his latest scientific encounter, this chemist-turned physicist can call on 30 years of research, most of it in weather modification.

He received his M.Sc. and Ph.D. in physical chemistry from the University of Montreal, studying the properties of aerosols. Although ultimately destined for a career in weather modification research, he spent only a brief, early period working on aerosols in the United States before returning to his native Quebec in 1955 as research chemist at Canadian Industries Limited. He moved into C-I-L's explosives research laboratory, working on such projects as a slurry explosive for use in mining operations, and explosive metal forming.

"Then they wanted to make me an administrator," says Dr. Goyer, a decision which was to prove the turning point toward weather modification. "I heard about the National Center for Atmospheric Research (NCAR) in Boulder, Colorado, and in September, 1962, became program scientist and Head of Atmospheric Physics."



Dr. Guy Goyer

**Using today's
technology to
solve age-old
weather
problems.**

Dr. Goyer built the department - "I had absolute carte blanche - it was a fun time." During the next eight years, the department tackled two major projects: controlled experiments on shock wave effects on rain, hailstones and ice formations and laser meteorology.

"Our main testing ground for shock wave experiments was at Yellowstone National Park, using Old Faithful. The geyser is active once an hour and we used the plume as a raining cloud and with cord explosives could duplicate lightning shocks."

His laboratory experiences with ex-

plosives proved a boon in these atmospheric studies. Similarly, he was able to draw on his very early research in light scattering theory for launching a laser meteorology project.

Lasers are commonplace in today's atmospheric research, but 20 years ago scientists were just beginning to use this technique, and Dr. Goyer was one of the first to work in the field. He led the development of the second system in the United States to probe the 20-kilometre dust layer.

In 1966, he turned his attention to hail suppression and three years of observations jointly conducted by NCAR and Colorado State University laid the foundation for the National Hail Research Experiment, a project to evaluate the feasibility of hail suppression.

He accepted another challenge in 1974 when he joined the Research Council as Head of Atmospheric Sciences. Over the next seven years the Atmospheric Sciences Department tripled in size and broadened the scope of its research.

Dr. Goyer says advancing technology has given researchers better tools for measuring the potential effects of hail suppression.

"The best, first way to evaluate our hypothesis is to get up in the clouds, and with the Research Council's airborne data we have indications that verify our assumptions." But, he says, scientists need better tools to evaluate the differences between seeded and non-seeded hailstorms, and "in the final analysis we have to look at hail on the ground."

In 1981, he left the Research Council to spend a year as field coordinator on a United Nations precipitation enhancement project in Spain and Switzerland.

Since his appointment as Research Fellow in 1982, Dr. Goyer has been working on the lightning forecast project. The CEA also has asked him to write a computer program which would allow a computer to automatically track storms through pattern recognition and produce forecasts at regular intervals.

Dr. Goyer says he will have some answers within a year, but he acknowledges that the problems are difficult and complex. He sums up by saying "if I knew what I was doing, I wouldn't be in research."

continued from front page

35-man team to carry out a major contract in in situ recovery research. He was appointed Head of the Oil Sands Research Department on its formation in 1980. Prior to 1974 he spent 10 years with Celanese Canada Limited, as a senior engineer involved in all phases of chemical engineering, and later as a division manager directing the development and marketing of a series of agricultural products.

Mr. Martin holds a B.Sc. in chemical engineering from the University of Saskatchewan, and an M.Sc. from the University of Birmingham. He studied and worked in England on an Athlone Fellowship.

Another customer for SCITECH

The Alberta Legislature Library plans to create its own on-line catalogue using SCITECH software under an agreement signed with the SCITECH management committee.

SCITECH, the first public on-line cooperative catalogue in Alberta, was developed by the Alberta Research Council, Alberta Agriculture and Alberta Environment libraries, with SPIRES programming support from the University of Alberta computing services.

Employee changes

We welcome to the Research Council: Research Technologists **Duane Friesen**, **Fred Ratke**, **David Rye**, Electronics Test Centre; **Bruce Mallas**, Materials and Testing.

Good wishes in new endeavours to: **Debbie Bernard**, Materiel Management; **Katherine Brechley**, Materials and Testing; **Pauline Braun**, **Sherry Brockmann**, Financial Services; **Alan Covington**, **Renee Elio**, Computing; **John Godfrey**, Geological Survey; **Connie Heckenliable**, Atmospheric Sciences; **Diane Hnatko**, Industrial Development; **Judith Zanin**, Financial Services.

Staff notes from all over

Dr. John Kramers, Geological Survey Department, was presented with the Geological Survey Department of Canada Service Award at the G.A.C. annual meeting in Fredericton, N.B. in May. The award, a special G.A.C. Service Award Tie and a plaque listing G.A.C. publications for the past five years, was made in recognition of Dr. Kramers' work in guiding the G.A.C. publication program from 1980 to 1985.

★ ★ ★

Roy Lindseth, a member of the Research Council's Board of Directors, has been appointed to the Natural Sciences and Engineering Research Council of Canada (NSERC). Mr. Lindseth is founder and president of Teknica Resource Development Limited in Calgary, and inventor of the "Seislog" process for stratigraphic interpretation. He has served as a member of NSERC's Electrical Engineering Grant Selection Committee for the past three years.

★ ★ ★

Helga Radvanyi-Starr, manager of the Alberta Oil Sands Information Centre, has been elected national president of the Canadian Institute of Energy (CIE). The CIE was incorporated in 1961 to provide a forum for all persons interested in the discovery, development and use of Canadian energy. Helga is also president of the Edmonton branch and has served on the national board of directors.

★ ★ ★

Karen Beliveau, coordinator of SWERP Information Centre, has been appointed to a two-year term as prairie regional director to the board of the Solar Energy Society of Canada, Inc.

★ ★ ★

Both Research Council teams competing in last month's Corporate Challenge came away win-

ning plaques. Three cheers for Carolyn Jones (captain), Bob Irving, Wes Baird, Steve Moran, Greg Sterenberg, Daryl Wightman, Peter Eng, Cheryl Hutton, Brenda Morgan, Brad Anderson, Barbara Bissell, Ruth Reminsky, Bill Winters, Bernice Young and Brenda DeJong (captain) along with team members Rudy Strobl, John Kramers, Raj Rajan, Tawfik Nasr, Robert Clarkson, Bob Fessenden, Birbal Singh, John Ford, Bill Huiskamp, Colleen Day, Rosanne Czar, Millie Miles and Wendy Robertson.

★ ★ ★

Staff from the Geological Survey and Oil Sands Research Departments participated in the Petroleum Society of CIM and Canadian Society of Petroleum Geologists annual meeting held in Edmonton last month, serving as organizers and in making technical presentations.

Papers and presentations were delivered by Shaun O'Connell, Peter McCabe, Don McDonald, Brian Rottenfusser, Daryl Wightman, Timothy Berezniuk, Geological Survey; Bryan Fuhr, Charles Reichert, Larry Holloway, Gordon Bird, Terry Stone, Jan Boon, Eddy Isaacs, Kirk Green, Vladimir Reitman and Lina Klein, Oil Sands Research.

Dan Prowse, Doug Malcolm, Jan Boon, from Oil Sands, and Rand Harrison, Geological Survey Department, were among the session chairmen. Mark Fenton and Bill Langenberg, Geological Survey, acted as guides on a tour of Highvale Mine.

On organizing committees were: Anne Ing, Peter Flach, Don McDonald, Brian Rottenfusser, Dixon Edwards, Sandra Walliser, John Godfrey, Doug Boisvert, Andy Bosman, Joe McGillivray, Floy Lister, Monica Price and Maureen Fitzgerald.

Next holiday August 5.

**ALBERTA
RESEARCH
COUNCIL**

Newsline



Cutting the ribbon, Dr. John Douglas, Vice-President of the Energy Resources Division, in a brief ceremony to acknowledge the gift of computer tomography equipment from the University of Alberta Hospital. Looking on are Ray Hansen, director and Dr. Donald B. Russell, acting chairman, Department of Radiology and Diagnostic Imaging, University Hospital. The equipment will be used by oil sands researchers to scan bitumen samples.

Oil sands in 3-D

Oil sands researchers will be able to see three-dimensional images of bitumen test samples thanks to a recently acquired X-ray computed tomography system once used for brain scans.

The CT equipment is a gift to the Research Council from the University of Alberta Hospital, Edmonton and the Foothills Hospital, Calgary.

A decade ago, computed tomography was on the leading edge of medical technology and the two hospitals were the first in western Canada to have CT scanners. Rapid technological advances in medical research have rendered this equipment obsolete, but it is getting a new lease on life in oil sands research through the joint effort of Ray Hansen, Director of

Radiology at the University Hospital, Paul Schmidt, Manager of Radiology, Foothills Hospital, and Dr. George Sedgwick, Oil Sands Research Department.

In oil sands cores and test packs, a sequence of CT scans can be taken at successive time intervals to give a complete map of the fluids and how they vary with time. Researchers can see the actual physical mechanisms controlling the flow through the porous sands for any given bitumen recovery process.

With such high resolution 3-D images, scientists have one more tool to enhance their knowledge of existing processes and assist in the development of new recovery methods.

Survey - you said it!

AUG - 2 1985

Hard, organizational information is the clear preference of Newsline readers over soft, social and human interest features. That's the message conveyed through the readership survey of Research Council staff.

Employee recognition, management plans, decisions and actions, policy and organizational changes rated as the most important topics. Also high on the list: impact of current external issues on the plans and activities of the Research Council, professional development, training and opportunities for advancement, and interdivisional cooperation.

At the other end of the spectrum, social news, human interest stories and visiting scientists are of less appeal to the majority of readers.

Of the 599 questionnaires sent to all Research Council employees, 268 (45%) were returned and 62 contained additional comments, a mix of bouquets and brickbats, but also constructive suggestions.

On the plus side, Newsline enjoys a high readership (83%), content credibility (75%) and scored well for readability (78%), photography (74%) and design (62%). Having said that, however, you rated Newsline low for timeliness of content (40%), and usefulness of the publication as a source of work-related information (37%).

Across the board, 80% of you felt new policies were important and more than half (52%) said you were not at all, or poorly informed about policies and policy changes. Almost as many of you (77%) want to hear more about organizational changes while 62% of you rated interdivisional cooperation as important.

continued on back page

Newsline is a monthly publication for the employees of the Alberta Research Council

Please send all submissions and direct all questions to Elizabeth Page, Alberta Research Council, 7th Floor, Terrace Plaza, 4445 Calgary Trail South, Edmonton, Alberta T6H 5R7

**ALBERTA
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A message from the President

Today's leaner economy has had its impact on every segment of the economy. Government, private industry and institutions must look hard at the available dollars and how to spend them.

The Research Council is no exception. With increases in the government grant going only into earmarked areas, and with variable contract revenues, every activity throughout the Research Council must remain under continuous scrutiny. Cost-cutting measures have been taken and will continue to be taken. At the same time, the Research Council has a responsibility to address new areas of activity to respond to a changing economy.

"People coming and going must be part of our business style, as contract revenues fluctuate, and research directions change", says

Dr. Robert W. Stewart, President.

For this reason, reductions in force will occur in certain areas even if the Research Council has overall growth.

"We are not determining our activities by our staff, but rather our staff by our activities," says Dr. Stewart.

The Research Council is a provincial government agency with many operational similarities to the public service, but as a Crown Corporation, it functions autonomously under a Board of Directors. Employees are hired as they would be in the private sector and, although they may have permanent status, they do not have tenure.

Dr. Stewart says staff should recognize that reduction in force will occur if contracts conclude or are reduced so that there is insuf-

ficient work to sustain current staff levels of people with particular skills.

"Decisions to alter the direction of research, as happened with the introduction of our Advanced Technologies program, will also influence the kinds of expertise needed. For these reasons, we recently had a reduction in staff in the Natural Resources Division," he says.

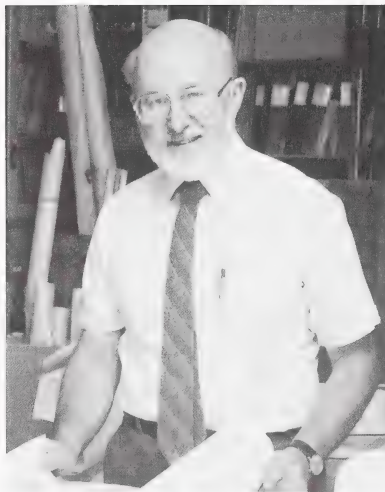
"It continues to be our intention to be fair to our staff. We will effect re-assignments where that is possible. Where it is not, and there has to be separation, it is our aim to be just, so that people can leave with a good feeling about themselves and about their association with the Alberta Research Council."

Geologist retires

After nearly 30 summers spent hiking and canoeing through the most remote area of northeastern Alberta, fighting the mosquitoes and black flies to record the geology of the province's Precambrian Shield, Dr. John Godfrey is saying good-bye to what has been a one-man research project for the Geological Survey Department.

Dr. Godfrey's life's work is bound in a series of reports and maps, detailing the geology and assessing the economic potential of 11,000 square kilometres bounded by Lake Athabasca and the Slave River. The five latest such reports are now in production.

"The Precambrian Shield is the oldest rock complex in Alberta, and whereas it is not a source of oil or gas, the potential exists for mineral resources - copper, uranium and molybdenum," says Dr. Godfrey. "In mapping the area, we have provided an inventory and maps of the bedrock and its mineral potential, information useful for prospectors and mineral exploration companies."



Dr. John Godfrey

Dr. Godfrey estimates he has tramped more than 5,000 miles through the northeastern Alberta bush, and although he won't be there again this year, he hasn't put away his hiking boots. In mid-July he was off on another tour - this time guiding 15 other adventurers through the Chilkooot Pass - the Klondike gold rush trail of 1898 - topped off with a little gold panning at Dawson City.

New look for P&O manual

The office "bible" is getting a new look to conform to the Research Council's visual identity program.

The Policy and Operations manual, now a collection of typewritten pages in an unwieldy binder, will be transformed to typeset on both sides of a page, and reduced to an easier to handle size.

In response to a request from the ARC/PSA Joint Committee, the format also is being revised. Manual contents will include the terms and conditions of employment sections organized to trace the growth of a "typical" career.

The new manual is expected to be ready for distribution early this fall and will be located in all Research Council libraries, with a list of current holders of the manual issued to all staff.

Also at the request of the Joint Committee, new and revised policy items with an accompanying explanation will be identified in Newsline.

Dr. Toshi Kaneda - more micro answers

(This is the second in a series of profiles on the Research Fellows of the Alberta Research Council.)

Dr. Toshi Kaneda published his first two papers on branched-chain fatty acids some 20 years ago and promptly found he had a scientific best-seller on his hands. Requests from other scientists working in the same area poured in, reaching a peak of 40 a day.

Branched-chain fatty acids are a major constituent of cellular fatty acids in many bacteria. Until 1960, when one branched-chain group was identified and reported, it was believed that the major cellular fatty acids of all living organisms were straight-chain types.

Dr. Kaneda's extensive studies led to the discovery of four additional branched-chain fatty acids. Over the next four years, he identified branched-chain fatty acids as characteristic and major constituents of cellular fatty acids in 10 species of *Bacillus* - providing a major tool for the chemical taxonomy of bacteria.

It was an auspicious beginning for the young scientist, who had abandoned a career in architecture for a chance to work in the promising new field of biochemistry. At the same time, he left his native Japan for North America to complete his postdoctoral studies before joining the Research Council in 1960.

Here his general mandate was microbiological research related to fossil fuels. One question was that of petroleum genesis: how petroleum porphyrins in crude oil are formed from the chlorophyll of green plant origins. After a frustrating attempt to determine the degradative pathway of plant chlorophyll to porphyrins by microorganisms - "much too difficult" he says - Dr. Kaneda turned to the biosynthesis of branched-chain fatty acids, which are possible biological sources of one class of hydrocarbons in petroleum.

Dr. Kaneda's research is testimony to much more than pure scientific skill. With a lack of both funds and equipment, he found himself improvising in his lab and cajoling other researchers around the University of Alberta campus to give him access to their facilities. "In most cases, crucial experiments were done by primitive homemade in-



Dr. Toshi Kaneda with vintage analytical and preparative gas chromatograph.

struments or using someone else's equipment", he says of those early days.

He still has the original gas chromatograph apparatus, literally tied together with string, which he and then-student John Fryer constructed "from available parts" to analyze lipid samples.

"I desperately needed an ultracentrifuge for my enzyme work, but could not afford to have one", says Dr. Kaneda. "At that time ultracentrifugation was the only way to separate DNA and gel electrophoresis was not yet used for the purpose."

Most ultracentrifuges at the university were running 24 hours a day, and Dr. Kaneda learned the deft art of slipping in his samples at odd hours, as he established friendships with U. of A. staff.

Despite the handicaps, the work proceeded, and in 1963, he solved an important problem in the biosynthesis of branched-chain fatty acids. Satisfied with the results, he sent his findings for publication and saw them in print within two weeks - a remarkable turnaround time in journal publication circles, and an indication of the importance of his basic research.

By 1965, with his reputation established through publication, he was provided with an annual grant from the Medical Research Council of

Canada, which allowed him to obtain the lab equipment, including the all-important ultracentrifuge.

His studies on the bacterial metabolism of cyclohexanecarboxylic acid, a model compound for bitumen, led to the discovery of a new aromatase. Several aromatases play crucial roles in the biosynthesis of aromatic amino acids and steroid hormones, and his discovery has contributed one more enzyme to this group.

In recognition of the international standard of his work, he was named Research Fellow of the Alberta Research Council in 1984.

Looking back to a quarter century of accomplishment, Dr. Kaneda says, "I was very fortunate to be in the right place at the right time to learn firsthand from the pioneers in their fields before the techniques became routine laboratory methods."

One of those pioneers was former Research Council scientist Dr. Harry Habgood.

"Dr. Habgood was developing the theory of temperature programmed gas chromatography which I was able to apply to lipid analysis in my work long before it became a standard method," he says. "During my postdoctoral training I learned basic radioisotope tracer techniques from two experts in the field and I was associated with Dr. Burton Craig, at the Prairie Regional Laboratory, who was then developing the Craig polyester, a widely used liquid phase in gas chromatography."

Today, Dr. Kaneda is continuing the research pioneered and developed by his microbiology group, which he believes contributes to a better understanding of basic lipid biology. Research Council support has allowed him to make an important contribution to the chemistry of living organisms and to the body of scientific knowledge.

When he isn't in his laboratory, he spends much of his spare time tending his collection of exotic plants, including the elusive night-blooming cereus from the jungles of South America. Some years ago, when he needed a conservatory for his ever-growing indoor garden, he was able, at long last, to draw upon his training as an architect - the only time, he says, he had a client for those skills!

continued from front page

While two-thirds of you said you find Newsline a useful source of information about the Research Council, almost as many (61%) said you wanted more news about yourselves and your colleagues' work. Less than half of you felt there should be more editorial comment, an opinion expressed most strongly by professional staff and management.

On topics where you felt poorly informed - the Research Council's relations with government and industry, for example - you indicated that not only were the subjects of importance, but that you want Newsline to be a source of that information.

In the months ahead, we hope to address these topics. Despite a generally favourable response to Newsline as it is, your answers reveal gaps to be filled. Just as Newsline in its present format evolved from previous soundings of employee opinion, this current

survey will serve as a benchmark for the future.

Sample comments:

Positive:

Greatly aids communication to ARC offices outside Edmonton ... easy to read ... useful ... informative ... my main source of information regarding ARC activities ... a good effort ... by and large a commendable publication ... interesting ... polished format ... OK as it is ...

Negative:

Waste of money ... extravagant questionnaire ... conservative ... a typical 'government' publication ... could be much more effective tool of communication ... needs to communicate to all staff ... cartoon strip ... poor medium of communication below division level ... cost of survey and Newsline itself would be better spent on research ...

Employee changes

We welcome the following to the Research Council: **Kathleen Potter, Robert Irving, Elahesh Keshavarz**, Research Officers; **Brenda Duggan, Leonard Force**, Research Technologists; **Melanie Kaplan**, Clerk Typist, Oil Sands Research; **Arlene Carbone**, Clerk Typist, Atmospheric Sciences; **Ken Gamble**, Research Officer; **Jacob Reichbart**, Technical Director, Advanced Technologies.

Good wishes in new endeavours to: **David Baker**, Advanced Technologies; **Allan Beerwald**, Terrain Sciences; **Arthur Fitzpatrick, Mary Hart, John Holub**, Industrial Development; **Sandra Kenefick, Nicholas Shatilla**, Coal Research; **Doris Pomazak**, Geological Survey; **Janet Shanes**, Biotechnology.

Staff notes from all over

Dr. Peter Tremaine has assumed the responsibilities of manager of Fundamental Research and Dr. Gordon Bird for the Hydrothermal Chemistry Group in the Oil Sands Research Department.

★ ★ ★

Instrument Repair, under supervision of Jim Kinasewich, has been transferred to the Materials and Testing Department, Applied Sciences Division.

★ ★ ★

Dr. Bob Humphries, Head of Atmospheric Sciences Department, has been named to the Research Committee, replacing Gary Martin, Head of Coal Research. The Research Committee, chaired by the President, plans, coordinates, reviews and evaluates research programs.

Department heads are invited to join the committee to provide input

from that level of management and give them exposure to Research Committee operations.

★ ★ ★

Rick Barlow, Frank Robitaille and Jim Renick, Atmospheric Sciences Department, were co-authors of a paper, "Increasing Irrigation Water Supplies by Snowpack Augmentation Through Cloud Seeding," presented at the 38th annual conference of the Canadian Water Resources Association, Lethbridge, in June.

★ ★ ★

Martin O. Jeffries, recipient of an Alberta Research Council scholarship 1983-84 and 1984-85, received his Ph.D. in June from the University of Calgary. In September he begins his postdoctoral fellowship in geophysics at the Geophysical Institute, University of Alaska in Fairbanks.

★ ★ ★

Dr. David Mitchell, Vice-President of Industrial and Engineering Research Division, has assumed responsibilities as acting head of the Industrial Development Department until a new appointment is made. Val Osinchuk is acting as coordinator for the department's Edmonton activities.

★ ★ ★

The Forest Products Testing Laboratory has been recognized by the Standards Council of Canada as an accredited testing facility for forest and panel products to accepted codes and standards.

★ ★ ★

The Research Council's display is at the Alberta Natural Resources Science Centre, 17th Street south of Highway 16, until September 2. The Science Centre is open daily from noon to 8 p.m.

ALBERTA RESEARCH COUNCIL

Newsline



Dr. Douglas Cant



Dr. Peter McCabe



Dr. Peter Tremaine

Senior Research Officers - the tops!

On the ladder of promotion for scientists and engineers at the Research Council, the top rung is that of Senior Research Officer. The appointment depends not only on an internal consideration of the quality of the individual's work, but on an external assessment by peers in the scientific community.

Of approximately 200 professional staff at the Research Council, 25 have achieved this distinction in recognition of their accomplishments in their field. Three appointments were made this year: Dr. Doug Cant and Dr. Peter McCabe of the Geological Survey Department, and Dr. Peter Tremaine, Oil Sands Research Department.

Dr. Cant received his Ph.D. from McMaster University and came to the Research Council from Union Oil

Company, California, in 1980. He is recognized to be among a handful of leading edge fluvial researchers.

Dr. McCabe earned his Ph.D. at the University of Keele, and came to the Research Council in 1983 from Exxon Production Research Company. He is an expert in coal geology and clastic sedimentology.

Dr. Tremaine received his Ph.D. from the University of Alberta and joined the Research Council from Atomic Energy of Canada in 1980. He has established an international reputation in the field of hydrothermal chemistry and high temperature thermodynamics and most recently was appointed manager of the Oil Sands Fundamental Research group.

Other Senior Research Officers at the Research Council are: Dr. Nancy

Cyr, Dr. Art Blades, Dr. Zac George, Dr. Alan Sanger, Chemistry Department; Dr. C.Y. Pan and Dr. Ed Bertram, Materials and Testing;

Dr. Rand Harrison, Dr. Wylie Hamilton, Dr. John Kramers, Dr. Grant Mossop and Dr. Chaitanya Singh, Geological Survey Department; Dr. Tom Christison, Civil Engineering and Dr. Steve Moran, Terrain Sciences;

Dr. Rao Puttagunta and Dr. Petre Toma, Oil Sands Research; Dr. Sujit Chakrabarty, Dr. Milan Selucky, Dr. Leszek Ignasiak and Dr. Sat Parkash, Coal Research;

Aldo Opel, Val Osinchuk, Industrial Development Department and Maurice Engler, Advanced Technologies Department.

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**ALBERTA
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Campus building - new name honours former director

Although the Research Council is about to vacate its premises on the University of Alberta campus, its presence there for 30 years and its lifetime association with the university is going to continue.

The building on 87th street, officially the Research Council of Alberta, but known by staff in recent years as the Campus building, is being taken over by the university and renamed the Robert Newton building in honour of the first full-time Director of the

Research Council.

At a ceremony held recently by the University of Alberta, Dr. Newton's nephew, Robert A. Newton, Edmonton, and nieces, Mrs. Beth Howson, Edmonton, and Mrs. Margaret Kemp, Calgary, unveiled the plaque in the entrance foyer.

Dr. Newton, who is now 96 and living in retirement in California, was a distinguished teacher and scholar. He was director of biology and agriculture at the National Research Council for

nearly a decade before becoming Dean of Agriculture at the University of Alberta in 1940. In 1941 he was appointed Acting President of the university and the following year was made President, a position he held until 1950.

In the earliest years of the Research Council, the president of the university carried out the function of Director of the Research Council. By 1950, with post-war growth well under way, a full-time director was considered essential, and led to a change in the Research Council Act. When Dr. Newton retired as university president, he continued to head the Research Council until his retirement as Director in 1951.

Dr. Newton was one of the early proponents for a separate Research Council facility which culminated in the Campus building now bearing his name.



George Pransky, Fort Saskatchewan High School teacher, working in the Oil Sands Research Department laboratory.

George Pransky - hands-on experience

When school ended in June, high school chemistry teacher George Pransky traded his classroom for a research lab.

Under a pilot program for science teacher training, George became a researcher in the Oil Sands Research Department. He spent five weeks measuring interfacial tensions between bitumen and water, and also had an opportunity to tour other areas of research at Devon, Nisku, Red Deer and the new facilities at Mill Woods.

The science teacher training program at the Research Council is the initiative of Dr. Jan Boon. Jan had seen such a program for teachers operated by 3-M in Minneapolis, and with Research Council senior management approval,

contacted the County of Strathcona school board to launch a project here. The school board agreed to promote the idea and provide financial assistance.

"It seemed to me to be a good way of showing first-hand how research is conducted and how results are transferred to industry," says Jan. "And it promotes awareness of the Research Council."

As he heads back to school, George Pransky says the experience has been interesting, worthwhile and provided him with a fund of resources - "if I have any questions, I know who to call on. Exposure to the Research Council also gives me career information I can pass on to my students."

In-house course continues

The second module of an in-house supervision course for Research Council staff begins September 24, 8:45 a.m. in the 6th Floor Conference Room, Terrace Plaza.

The six half-day sessions are designed to give participants useful on-the-job skills. Dates and topics to be covered are: Sept. 24: Communicating with Confidence; Oct. 1: Listening with Understanding; Oct. 8: Improving Employee Performance; Oct. 15: Employee Performance Follow-up; Oct. 22: Correcting Problem Behaviour; Oct. 29: The Performance Appraisal Interview.

Wolf Gut, Human Resources Department, who is conducting the course, says there will be space for some staff to start the program at this time, provided they attend a brief introductory session prior to September 24. Those interested should contact the Human Resources Department (438-1666).

Wolf also would like to hear from department heads wishing to have this program specifically tailored for their staff.

Dr. Brian Hitchon - directing unique team

(This is the third in a series of profiles on the Research Fellows of the Alberta Research Council.)

If you were to ask Dr. Brian Hitchon about his research these days, he would reply "research has little to do with my current work."

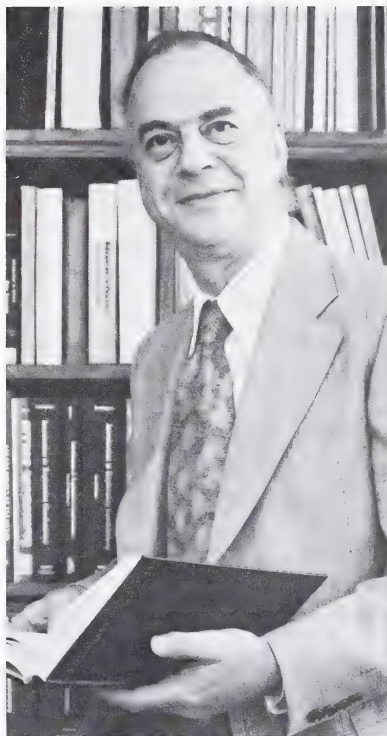
That doesn't mean this prolific scientist has slowed down - far from it. As project manager of the Research Council's Basin Analysis Group, Dr. Hitchon is directing a unique team of scientists which he describes as being on the leading edge of hydrogeological research.

"Our Basin Analysis Group is different from other such groups. We are looking at the western Canadian sedimentary basin from the point of view of using the history of rocks as a background to the flow patterns of subsurface fluids," he says. "If one is going to get into work related to petroleum exploration, then one has to be equally interested in both the rocks and the way fluids move."

The Basin Analysis Group's long term objective - to be able to predict the occurrence of crude oil and natural gas through knowing the hydrogeological history of a sedimentary basin - is still several years off yet. But Dr. Hitchon believes that if it is possible to do this sort of work in an area as well drilled as Alberta, then this basin will serve as a model for application to similar sedimentary basins anywhere in the world. In addition to looking at the regional western picture, the group has concentrated efforts on fluid injection and deep waste disposal and is also tackling work in the Beaufort-Mackenzie Basin.

In fact, the Basin Analysis Group has so many contracts - a happy situation directly attributable to Dr. Hitchon's ability to deliver results on time - that there has been no time to publish the work.

"That's our big difficulty now - we are trying to get the development work done on the side or as part of contracts. What we are doing is very much applied science, and although the types of problems being studied are not directly related to petroleum, combined with what we hope to do in the next three to five years, this should give us something few others have - the ability to assist the petroleum industry here and beyond North America from



Dr. Brian Hitchon

the hydrogeological point of view."

That Brian Hitchon is in Alberta at all is one of those quirks of fate that so often determine a destiny. Although he was born in Canada, his parents returned to England when he was six. By the time he was 10, young Brian, influenced by his amateur geologist father and an uncle who struck it rich as one of the discoverers of the Burma oil fields before World War One, had chosen his vocation.

He graduated with honors from the University of Manchester, specializing in mineralogy and petrology. With a scholarship, he took his Ph.D. in the geochemistry of hard rocks, concentrating on northern Scotland.

"I then had a choice - conscription into the army or service in what was then the Colonial Geological Survey. I was given a choice of three posts - Fiji, which had no appeal, British Guiana, which meant spending months in the jungle, or Northern Rhodesia. I chose the latter."

He spent the next two years mapping and doing some engineering geology at the site of the Kariba Dam, but by 1957, he was searching the geological

magazines for work in Australia, Canada or South Africa.

"One day a colleague showed me an advertisement in the magazine *Nature* for a petroleum geochemist at the Alberta Research Council, and suggested I apply for it. I protested that I knew nothing about petroleum - petrol was something I put in my car - but he urged me on because he knew I wanted to return to Canada. I would never have looked in a general science magazine like *Nature*."

Brian Hitchon answered that ad and the rest is history. He joined the Research Council on September 11, 1957 and for more than a quarter century has concentrated on formation fluids geochemistry, both the origin and migration of oil and gas and chemistry of the accompanying formation waters as well as hydrodynamics. He has published a substantial body of work either on his own, or in cooperation with other scientists in universities, industry or geological surveys in the United States and Australia.

He says he rose through the ranks, became special assistant to Dr. Ernie Wiggins during the latter's time as director, then when Dr. Wiggins retired, was named acting director.

"In less than one year I went from a staff of one technician to attempting to run the entire Research Council for some 11 months until Gilles Cloutier was appointed president. I then had a period running administration. I didn't really like that - there's no science in that sort of administration."

His next appointment as special assistant in Facilities Development proved more interesting, and he played a significant role in developing the guidelines which will shape the physical look of the Research Council in the years ahead. He was one of the proponents for consolidating staff as much as possible in one location, supported a south Edmonton site to replace the Campus and Terrace Plaza quarters, and was involved in the initial planning for the Devon building and a new office facility at Clover Bar.

His contributions to the Research Council and to science were recognized when he was appointed a Research Fellow at the Alberta Research Council. On the side, he is executive editor of *Applied Geochemistry*, the new journal of the International Association

continued on back page

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tion of Geochemistry and Cosmochemistry (IAGC), secretary of the IAGC, a councillor for the Association of Exploration Geochemists, and chairman of a working group on water-rock interaction of the IAGC. He also is co-editor and main organizer for the Canadian/American conferences on hydrogeology held in Banff each year.

After 33 years as a scientist, he sums up research this way: "you have a clear objective, and although you don't know what the answer is going to be, you are confident you will get an answer. It may not be the right answer, or maybe someone will change it five or ten years later - that happens all the time. Even with experience to choose the right problem to work on, there is always the element of surprise which keeps research exciting."

Staff notes from all over

Dr. J. Tuzo Wilson, Chancellor of York University and former director-general of the Ontario Science Centre, will present the John A. Allen Lectureship in Science September 24 at 4 p.m. in the University of Alberta Humanities Centre, Lecture Theatre 1.

The lectureship is one of three 75th anniversary lectureships presented to the university by the Research Council, and is open to the public. Staff are encouraged to attend.

★ ★ ★

The official opening of the Coal Research Centre Devon is scheduled for September 13. Federal and provincial government representatives taking part in the ceremonies will be Hon. Robert Layton, Minister of State for Mines; Hon. Tom Chambers, Minister of Alberta Public Works, and Hon. Don Sparrow, Associate Minister of Alberta Public Lands and Wildlife. Eric Musgreave, Chairman of the Board of Directors of the Alberta Research Council, will act as master of ceremonies.

Research Council screen "star"

We have our first motion picture introduction to the Alberta Research Council, and it is now available for staff use.

The nine-minute, 16 mm film is intended to give viewers a general impression of the Research Council's range of activities and our support of industry and government. Also available on videotape in formats compatible with North American, European and Asian systems, the film replaces the four-year-old slide-tape production.

The Alberta Public Affairs Bureau assisted our Public Relations Office in this new film project by Frame 30 Production Limited, of Edmonton.

Copies of the film are available for staff use by booking through the Public Relations Office in Edmonton, and at offices in Calgary and Red Deer. You are encouraged to use the film or videotape whenever meeting visitors or groups outside your offices.

For your information, the film will be screened:

September 10:

9:30 a.m. - Highfield Place, photocopy area,
11:30 a.m. - Campus Building, conference room,
2 p.m. - Clover Bar, lunch room,
3:30 p.m. - Terrace Plaza, lunch room.

September 11:

9:30 a.m. - Parson's Property, conference room,
11:30 a.m. - Mill Woods building, lunch room,
2 p.m. - Coal Research Centre Devon, conference room,
3:30 p.m. - Nisku, conference room.

Salary administration changes on the books

The Human Resources Department plans a series of meetings with professional staff, beginning in late September, to discuss changes in the Research Council's salary administration system.

The new administration system, approved by the Board of Directors, is a result of a review of the current salary

Employee Changes

We welcome to the Research Council: **Ernest Chang**, Technical Director, Advanced Technologies; **Remedios Estigoy**, Research Technologist, Coal Research; **Cathy Lemko**, Research Technician, Biotechnology; **Erwin Po**, Drafting Technologist, Graphics Services; **Desmond Wynne**, Assistant Research Officer, Geological Survey.

Good wishes in new endeavours to: **Arlene Carbone**, Atmospheric Sciences; **Mona Barron**, **Sandra Hafichuk** and **Roger Kirchen**, Coal Research; **Shelley Klein**, Editing and Publications Sales; **Floy Lister**, Geological Survey; **Vilda Ross-Smith**, Materials and Testing; **Brenda Duggan**, Biotechnology.

Getting the message

If you want to "post a notice" or stay informed about events such as seminars, visiting delegations and similar events, consult the Research Council's electronic notice board on CAESAR.

Log into your own account. At the \$ sign, type Events, which will display the following Menu: 1 - View Events, 2 - Cancel Event, 3 - Modify Event, 4 - Cancel Event, 5 - Exit.

Type whichever number you wish to execute and input your message. The event will be automatically deleted once the date expires.

If you do not have an account on CAESAR, sign in: USERNAME: Example; PASSWORD: User. At the \$ sign, type Events, which will display the Menu.

system for professional research staff, conducted earlier this year by a Remuneration Study Group. The modifications to the existing system will be introduced in 1986.

Separate seminars for managers to acquaint them with the system will be held prior to 1985 annual performance reviews.

**ALBERTA
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Newsline

CANADIANA

OCT - 8 1985

Membrane separation ready to market

Transferring technology for commercial application is a gradual process says Dr. C.Y. Pan, who is seeing 15 years research on membrane permeation at the threshold of marketability.

"Our work is still not finished," says Dr. Pan. "There are laboratory problems yet and technical details which still require our assistance for the company to succeed."

The company is International Permeation Inc., born from the former Alberta Helium Ltd., and ready to design and manufacture gas separation systems based on the membrane technology first developed at the Research Council. The story of that

development goes back 25 years when Dr. Harry Habgood performed the Research Council's first experiments to recover traces of helium from natural gas. Dr. Habgood, now retired, recalled how he set up a small project "when we had a wonderful little apparatus that we built in which we could take ordinary laboratory glass tubing and slowly feed it into a furnace and pull it out the other end at high speed to make a fine, hollow filament. We cut this in lengths and sealed it together so we had a bundle of filaments we could pass natural gas through and the helium would diffuse so we could collect it."

It was the beginning of an idea,

although Dr. Habgood says not a practical one for recovering helium from natural gas. But Dr. George Govier, who had proposed the idea originally, was not about to let it die. Ten years later, as chairman of the Alberta Energy Resources Conservation Board, Dr. Govier enlisted support from TransCanada PipeLines Ltd. and Alberta and Southern Gas Company.

The two companies, along with the Research Council, formed Alberta Helium Ltd. to finance a research project on helium separation. Dr. Habgood again headed the project and was joined by Dr. Pan in 1970. The research led to the selection of plastic membranes - long strands of hollow fibre finer than ordinary sewing thread, densely packed in a three-foot module.

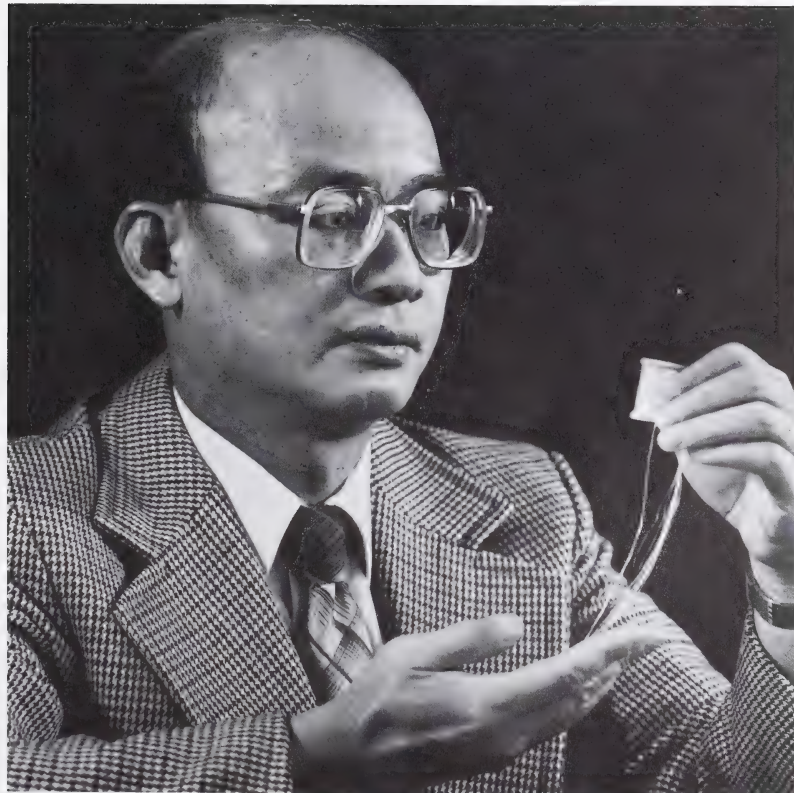
By the late 1970s, a helium recovery pilot plant was operating at Edson to demonstrate the technique on a large scale.

While the process was proven to be technically sound, there was no ready commercial application because of a huge surplus of helium in the world. Meanwhile Dr. Pan and Dr. Habgood had been considering the possibility of applying the separation process to other gas mixtures.

Dr. Pan explains that the membrane process has been known for many decades, but nobody could commercialize it before 1978 because the membrane technology itself was not sufficiently developed. The breakthrough occurred with an assymetric plastic membrane. Other U.S. companies developed a gas separation permeator, but Dr. Pan says, "the Research Council's membrane, adapted from a module used for water purification, has higher permeability and selectivity."

"We have taken the practical approach by examining what is already on the market - in this case, a water wet membrane - and developed a special

continued on page 2



Dr. Pan holds a spool of thread and sample of fine strands of hollow plastic fibre which form a permeation membrane for separating gas mixtures.

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**ALBERTA
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Number crunching in ASD

For statistician Ray Wong, work is a "numbers game."

"Our job is to use statistical techniques to find the patterns, trends, relationships or differences in data sets," Ray explains. "These are important for providing a quantitative assessment of research results."

Ten years ago, the statistics group in the Atmospheric Sciences Department was set up to analyze the meteorological data from cloud seeding experiments to detect the effects of cloud seeding experiments.

"Number crunching" is not restricted to weather modification, however, and the statistics group has found their expertise directed to assisting other Research Council departments as well as other government departments and agencies.

The methods developed for meteorological data can be applied to other geophysical data. Ray has done a classification of crude oil samples based on trace elements, and examined soil data to determine sensitivity to acidification.

He is now analyzing data from an oil sands field pilot plant, in a project for AOSTRA in oil recovery research.

The group is also developing a crop yield model for Alberta Energy and Natural Resources, using data from Energy and Natural Resources, the Atmospheric Environment Service and the Alberta Hail and Crop Insurance Corporation. Such a model should make it easier to assess crop yield potential based on weather information.



Statistician Ray Wong and tools of his trade.

Ray says he doesn't have to be familiar with the discipline - his main interest is in the figures. Statistics allow researchers to draw inferences from observations - "we really provide another tool in a scientific investigation."

Mill Woods update

Most of the laboratories and administrative wing in the new building are now complete, and facilities consultant Victor Jackson says electrical and mechanical hand-over tests are progressing satisfactorily. Public Works, Supply and Services property management personnel were scheduled to move into the building September 30.

"We are still experiencing difficulty in obtaining satisfactory fume hoods," says Mr. Jackson. "This has caused a serious delay and we are attempting to borrow some equipment. If this is successful some staff may be moved from the Campus building in November."

Another key area yet to be completed is the Computing Department's space. The main computing room has been re-scheduled to be ready for occupancy in February of 1986.

"Until we get the computers up and running and fume hoods installed, we can only have restricted use of the building," says Mr. Jackson. The projected moving date is now set at late February or March.

Hardy, Grace lectureships

The second and third lectures in the University of Alberta's 1985 series, Science, Technology and Society take place this month.

Dr. Douglas Wright, president and vice-chancellor of the University of Waterloo, will present the Robert M. Hardy lecture in Engineering October 15.

Dr. Norman E. Borlaug, Department of Soil and Crop Science, Texas A&M University, and winner of the Nobel Peace Prize in 1970 for the Green Revolution, will present the Nathaniel H. Grace lecture in Agriculture October 22.

Both lectures will be in the University of Alberta Humanities Centre, Lecture Theatre I, at 4 p.m.

The lectureships are a gift to the University of Alberta from the Alberta Research Council in recognition of the university's 75th anniversary in 1984.

The University of Alberta has allocated parking space in "U" zone for Research Council staff at the university's evening rate (\$2) for both lecture days. Staff wishing to use this parking are asked to identify themselves at the entrance to N and U zones, accessed from Saskatchewan Drive and 90 Avenue.

Membrane separation *continued*

process to dry the membrane for use in gas separations. The off-the-shelf permeator is better and cheaper."

As with the helium process the next step for other gas separations is pilot scale.

"Once we demonstrate the capability of the process to a potential customer, the process could be commercialized very quickly," says Dr. Pan.

Those potential customers are many and varied. Companies engaged in enhanced oil recovery prefer carbon

dioxide as a reactive agent, and gas separation would allow recycling of the carbon dioxide.

Similarly, hydrogen is used extensively to upgrade, treat and process heavy oil and bitumen and for refining conventional crude oil. Hydrogen separation from the unused gas in these processes can be accomplished with membrane permeation. Hydrogen sulfide and carbon dioxide from sour natural gas, and hydrogen from ammonia plant purge gas can be recovered with the technique.

Grant Mossop outlines atlas proposal

Touring and lecturing in Britain and Europe, seeing the front line in university and private industry laboratories, has provided Dr. Grant Mossop with new insight into what is happening in the field of geology.

During his nine-month study leave at Oxford University, Grant lectured at 14 institutions, including Cambridge, Glasgow, Liverpool, Leeds, various London colleges, and Utrecht and Shell labs in The Netherlands. He participated in field workshops in the U.K., Ireland and Spain, and met fellow geologists and graduate students both in their work settings and at conferences.

"What is emerging is very exciting, not only in individual studies but now also in team projects among research students. We used to be exclusively trained to work alone, conduct in-

dependent research. That tradition persists to a considerable degree, but there is a growing trend to forge teams of three or four students, each specialized but working together in the same field areas and inter-relating their findings. What emerges is a set of theses with impact considerably greater than the sum of the parts."

"It's a parallel phenomenon to what we're seeing in institutional research here in Canada and indeed here at the Research Council. Having solved some of the easier, small-scale sedimentological problems, our attention is shifting to large and complex sequences, the deciphering of which is best tackled by teams of specialists working together."

Grant is preparing the groundwork for his own ambitious project to synthesize the stratigraphic history of the

Western Canada Sedimentary Basin.

"The existing Geological Atlas of Western Canada is a remarkable publication and is still used as a primary reference," he says. "But it was put together in the 1960s and is grossly out-of-date. We now have four or five times more data and new ideas of what controls what."

Grant is proposing that work on a new version be undertaken by 12 to 15 geologists in various companies, universities and surveys in western Canada, coordinated and managed by the Research Council. Such a major project requires manpower commitment from outside but also financial support from the private sector—perhaps a million dollars over four years. He says preliminary response from the outside is "very positive."



This field of winter wheat was grown from seed produced by plants developed from cultures in the Research Council's biotechnology laboratory. Mark Lazar checks the maturity of the second generation seeds prior to harvesting. The new seeds will be germinated, and allowed to grow for two to three weeks, before being subjected to low temperatures for hardening. The next step will be overnight freezing before the plants are brought back to room temperature and repotted in soil. The project is part of a three-year investigation by Dr. Lazar and Dr. Tony Chen, aimed at improving winter wheat hardiness.

Coal Research Centre Devon



Robert Layton, federal Minister of State for Mines, and Eric Musgreave, Chairman of the Alberta Research Council Board of Directors, following the unveiling of a plaque to mark the official opening of the Coal Research Centre Devon. The centre houses the Research Council's Coal Research Department, CANMET - the federal western research laboratory, and the Coal Mining Research Centre.

"... The work of this centre is vital to the ultimate success of the coal industry in this country. The centre is addressing the challenges of the future through extensive research into coal preparation and conversion of coals to alternative fuels ... these three research organizations, working together, will improve product quality and productivity at every stage of the western coal industry ... With the opening of Devon, we are sending a message that we are a world leader in technological advancement ..." From an address by Robert Layton, federal Minister of State for Mines, at the official opening of the Coal Research Centre Devon.

Near the entrance to the new \$22-million Coal Research Centre is a stand of tall evergreens. They form a link between the present and the past. Inside the building are two plaques. One tablet marks the official opening September 13. The other tells of the pioneer family who broke the land more than 75 years ago. Their names were Luke and Victoria Smith and they came from Poland in 1898 to settle with a group of families west of Nisku. By 1902, Luke had saved enough money to make a down payment on a quarter section at Devon. In 1904, Luke and Victoria moved into their log home and for the next 45 years they farmed their land, raised 13 children, suffered the tragic loss of four young sons in a barn fire in 1922, struggled through the drought and depression of the thirties, and eventually retired to Edmonton in 1947.

Frank Smith, one of Luke and Victoria's sons, represented the family at the official opening ceremonies, and recalled that as a small boy he planted the trees.

Staff notes from all over

Dr. Sugit Chakrabartty, senior research officer in the Coal Research Department, is in Sapporo, Japan until December. Dr. Chakrabartty received the 1985-86 Japanese government research award for foreign specialists and is spending three months at the Japanese Government Industrial Laboratory conducting fundamental research on characterization of coal liquids.

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Surindar Singh, Oil Sands Research Department, has received his Ph.D. in chemical engineering from the University of Alberta. His thesis, A Long Term Assessment of Canadian Petrochemicals, contains an analysis and projections for the petrochemical industry over the next 30 years.

Surindar is an analyst with the Research Council's technical and economic evaluations group at Clover Bar.

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Cocktails, a four-course dinner, dancing and for the lucky ones, a draw of several attractive door prizes. That's the plan for December 6 when the Research Council's annual Christmas banquet and dance will be held at the Edmonton Convention Centre.

Tickets (\$23 per person) go on sale October 28. Members of AUPE are eligible for a \$10 rebate per ticket. The Professional Staff Association and AUPE Local 60 are co-sponsors of the event.

Employee changes

We wish the following well in new endeavours: **Wes Baird**, Geological Survey; **Neal Dressler**, Materials and Testing; **Grace Ferracuti**, Biotechnology; **Frank Ferracuti**, Palle Mikkelsen, David Redford, Oil Sands Research; **Terri Slevinski**, Civil Engineering.

**ALBERTA
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Newsline

New salary structure for professional research staff to be implemented

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A major change in the Research Council's salary administration system for professional research staff will be introduced June 1, 1986.

Under a proposal approved by the Board of Directors, salary ranges with a stated minimum and maximum only and a bonus arrangement for outstanding performance will replace the current salary structure and merit system.

The Board of Directors also agreed to adopt a pay policy which will peg research officers salary maximums to within 10 per cent of Alberta industry job rates for similar levels of work.

Economic adjustments for 1985 will not be made until after the provincial government announces its annual economic increases.

The new system is designated for professional research staff. Application of a similar salary structure and bonus arrangement for administrative professional staff is currently under review.

The adoption of salary ranges with a minimum and maximum and bonus awards for exceptional performance will give the Research Council more flexibility in rewarding outstanding ef-

forts by staff, says Dr. Robert W. Stewart, president. He particularly advocates an awards system to recognize significant contributions with "an appreciable sum of money - an amount that would be noticed."

Under the current system, it is possible for staff receiving a performance rating of four or five to attain more than one increment annually. An employee judged to be outstanding can thus move through the salary range and reach the maximum salary early in his or her career.

continued on page 2



The Civil Engineering Department's mobile data acquisition system returned home in October after covering 23,000 kilometres from Pine Pass, B.C. to Truro, N.S. in a national pavement impact study for CANROAD Transportation Research Corporation. Len Chase, Bill Sadoway,

Randy Bilyk and Leo Renier were the Research Council team installing 13 test sites and conducting field testing. The information will give CANROAD the basis for defining uniform trucking regulations across Canada.

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The new system is designed to permit uniform advancement through the salary ranges and reward outstanding achievements with a performance bonus. Where an individual consistently performs well, consideration will be given to early promotion. The current promotional bar between associate research officer and senior research officer will be maintained and strengthened, and a more substantial promotional bar between assistant and associate research officer classifications will be reintroduced.

Dr. Stewart indicated he wishes to award performance bonus payments of up to 15 per cent of salary for a five rating and up to 10 per cent of salary for a four rating. It is anticipated that up to five per cent of staff will receive five ratings and about another 15 per cent will be rated four. He told the Board the performance budget will be calculated on this basis. Approximately two and one-quarter per cent of the Research Council manpower budget will be made available for bonus payments.

Performance standards for level four and five ratings will be strengthened. As a consequence, fewer staff can expect to receive ratings of four or five, but qualified ratings carrying a plus or minus (e.g. 3+) within each of the performance levels will be permitted. In-range merit adjustments will continue to be awarded annually to all staff whose performance is rated fully satisfactory or higher.

Training courses offered

One of the aims of the Human Resources Department is staff development through the provision of in-house training courses. Several courses designed to provide useful on-the-job skills are being introduced beginning this month:

Conducting the Hiring Interview *November 19 or December 3.*

This basic model taken from the Supervision course is for anyone confronting the task of interviewing. Almost every professional is a potential interviewer, says Wolf Gut, and should be aware of such factors as human rights legislation as well as the Research Council's requirements and standards for selection.

Setting Job Standards/Conducting the Appraisal Interview

November 26 or December 3.

This course serves as an introduction in basic skills or as a refresher course for managers and professionals, and is particularly applicable with the increasing emphasis on how well job standards are developed and used in evaluating performance.

These courses are half day sessions beginning at 8:30 a.m. in the 6th Floor Conference Room, Terrace Plaza.

SAS (Statistical Analysis System)

Introductory: *November 18*

Advanced: *December 2*

SAS is a software package providing extensive tools for data management,

statistical analysis and report writing.

The introductory course prepares you to do elementary data analyses using data definition commands and procedures to transform and subset data. SAS procedures for creating and using permanent data sets will be covered. Minimal familiarity with VMS and EDT is assumed.

The advanced one-day course covers such SAS features as reading and updating permanent data sets, merging multiple files, generation of summary data sets for subsequent analysis, advanced data formatting, and a review of selected statistical procedures. Prerequisites include the introductory course or some experience working with SAS.

Both all-day sessions will be conducted by Layne Marshal, University of Alberta, at the Campus building conference room.

Two courses - An Introduction of VAX/VMS and Version 4 Update (enhancement of VAX operation system) - will be given depending on demand. The courses are presented by Digital Equipment of Canada Limited to instruct participants in the use of the Research Council's computing system.

Module C of the Supervision course will start January 14 and run for six Tuesday mornings. This is the third segment of a three-module course covering the basic principles of supervision with extensive use of videos and role-playing.

Contact Brenda Morgan, Human Resources, 438-1666 ext. 238, regarding registrations for all courses.

Robert M. Hardy 1906 - 1985

Dr. Robert Macdonald Hardy, O.C., D.Sc., P.Eng., M.Sc., F.E.I.C., D.L.S., F.R.S.C., whose contributions as an engineer and educator earned him world recognition, died October 2 in Edmonton.

Dr. Hardy had a long association with the Research Council, first as a member of the Technical Advisory Committee from 1946 to 1959 and subsequently as a member of the Board of Directors until his retirement in 1984.

A pioneer and specialist in soil mechanics, he was instrumental in the development of a number of major projects including the construction of giant pipeline projects, sections of the Alaska highway, major dams and initial development of the oil sands in northern Alberta.

He developed and supported the joint research in highway engineering carried out by the Alberta Research Council within the University of Alberta's Civil Engineering Department.

Dr. Hardy joined the University of Alberta's Faculty of Engineering in 1930 where he served as professor and Dean of Engineering for 41 years. In 1951 he founded R.M. Hardy and Associates, now Hardy Associates, and remained its chairman until his death. He was awarded the Order of Canada in 1974.

"Bob Hardy was a good friend of the Research Council," said Dr. Robert Stewart, President. "His wisdom, long experience and good humour will be missed. We in the Research Council, and we in Alberta, are richer for his having been among us."

Policy changes announced

Two policy changes, dealing with severance pay benefits and out-of-province travel, have been approved by the Operations Committee, effective immediately.

Severance pay benefits, at the rate of one week's salary for each full year of service, is increased to a maximum of 20 weeks from the previous maximum of 13 weeks. These new benefits apply to all employees in the event of position abolishment or reduction in force.

Out-of-province travel when under \$1,000 may now be approved by a vice-president. All estimated travel costs in excess of \$1,000 must be approved by the president or his delegate. Travel initially estimated to be under \$1,000, which finally totals in excess of \$1,000 must be resubmitted for approval by the president or his delegate.

Plant pigment undergoes transformation

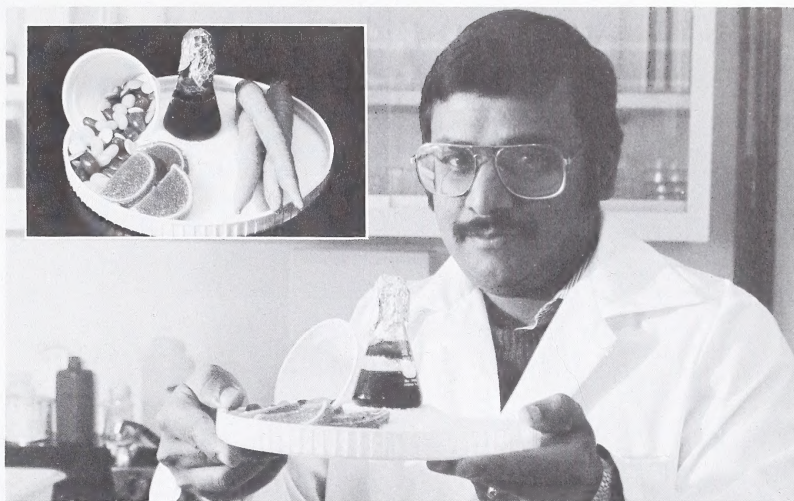
The labels of thousands of manufactured food products contain the words "artificial coloring" but a small research project now under way in the Biotechnology Department could one day contribute to changing 'artificial' to 'natural' coloring.

Dr. P. Nagarajan is carrying out experiments on anthocyanin production, the red pigment abundant in carrots, in a joint research project for BIO LOGICALS inc. and International Genetic Sciences Partnership, of Israel.

Plant cells are capable of synthesizing various chemical substances such as pigments in tissue culture. Dr. Nagarajan is using anthocyanin screened from a specially developed carrot variety sent from Israel. This innoculum, when grown in a solid agar media for 15 days turns deep purple. The cells from the tissue culture (from solid agar medium) are then cultured in a liquid medium with added sugar, chemicals and vitamins, and agitated for another two weeks.

"The cells multiply very fast and form single cell suspension," says Dr. Nagarajan. "Our next step is to feed the cells into an air lift fermentor in the lab where they may multiply even faster."

One of the major objectives of the project is bringing the innoculum to scale-up in the 2,500-litre fermentor in



Carrots to candy? The red pigment found in a special variety of carrot is being cultured at the biotechnology laboratory in research to develop a natural food coloring.

the Mill Woods facility, he says. But first, he must screen the cells to determine the optimum conditions and media concentrations for rapid cell multiplication - "we want to find which of the added chemicals we can eliminate and which sugar we can substitute for the galactose we are now using."

Success also will depend on cost-

effectiveness and a substitute such as glucose or fructose would greatly reduce end-product costs.

"There is a huge international market in confectionaries alone for such a natural food coloring agent," says Dr. Nagarajan. "Meanwhile, the research is a real experience for all of us in growing plant cells in fermentors, which is complex and difficult."

Staff notes from all over

Dr. Duncan Currie, Vice-President, Applied Sciences Division, and Dr. Don Gerson, Head of the Biotechnology Department, are in Heilongjiang, China, at the invitation of the Academy of Sciences, Harbin, to promote scientific exchange and define areas of mutual interest. The Research Council and the Heilongjiang Academy, which has a staff of approximately 1500, signed an agreement of cooperation of science and technology earlier this year.

Also travelling in the group are Dr. Sherman Weaver, executive director of the Alberta Environmental Centre Vegreville, and Ted Szabo, Alberta Energy and Natural Resources.

Heilongjiang, a province in northern China, and Alberta signed a twinning agreement in 1981 to promote mutual economic interests.

★ ★ ★

The Research Council's Calgary facility will be officially opened November 28 in a joint ceremony with the Calgary Research and Development Authority. Provincial and civic government representatives taking part in the ceremonies will be Hon. Hugh Planché, Minister of Economic Development and Calgary Mayor Ralph Klein.

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A date to remember: December 19 for the annual staff meeting. Details in next month's Newslines.

★ ★ ★

Mark Johnson, Atmospheric Sciences Department, has been elected first vice-president of DECUS Canada, the largest computer users group in the world. Mark is co-chairman and program chairman for the 1986 DECUS

Canada symposium to be held in Edmonton in February.

★ ★ ★

Dr. Doug Cant, Geological Survey Department, presented a talk on the Alberta portion of the Western Canadian Sedimentary Basin at a conference on Foreland Basins in Switzerland.

★ ★ ★

Dr. Ernie Chang, Advanced Technologies, gave a presentation on expert systems at the annual meeting of the Royal College of Physicians and Surgeons in Vancouver.

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The Human Resources Department has videotapes based on the best-selling books, *In Search of Excellence* and *A Passion for Excellence*. The two one-hour videos are available on request.

Gladys Stott says goodbye

Gladys Stott will say good-bye to the Research Council this month. After 35 years, she is going out the way she came in - championing what she considers fundamental to a research organization - intellectual competence and integrity.

When Gladys, B.Sc. in hand, landed a job in the gasoline and oil testing laboratory in 1951, she faced her first big hurdle. Then director Dr. Nathaniel Grace "didn't think women should be on the Research Council professional staff." A compromise was struck and Gladys was hired as a technologist on six months probation.

The six months stretched to two years and Gladys says only the intervention of Dr. O.J. Walker, head of the University of Alberta's chemistry department and a member of the Research Council's Board, persuaded Dr. Grace to accept her to the professional staff.

If Gladys was breaking new ground as the first post-war woman professional at the Research Council, the gasoline and oil testing laboratory itself was a pioneer in consumer advocacy. The provincial government set up the testing laboratory in the late 1930s to survey gasoline retail outlets in what Gladys calls a progressive move for the times.

"We are still named in the provincial Consumer and Corporate Affairs Fuel Oil Licensing Act and are still advisors to the department," she says.

Gladys first worked in the brick building originally built to house the gasoline and oil testing laboratory and now the University of Alberta's arts annex. In 1956 she moved to the Research Council's new campus building and the following year became assistant chemist. In 1977 she was named chief chemist. By this time the testing lab's staff had tripled and the work changed dramatically.

"Our clientele has changed, too," she says. "Originally most of the work was for the provincial and federal governments. During the war, the lab was taken over exclusively for military work, and we still do all the DND testing west of the Ontario/Manitoba border. When Leduc came in, the laboratory started testing crude oil for companies until commercial labs were set up. Today 97 per cent of the clients



Gladys Stott

are from the private sector - refineries, engine companies, insurance adjusters, consultants, anyone with a problem related to refined petroleum products."

In 1981, Gladys was promoted to manager of product evaluation, overseeing not only the gasoline and oil testing laboratory, but also the industrial chemistry laboratory and the canal liner project.

She sits on the federal committee for writing Canadian General Standards Board specifications. "I have enjoyed the work in specifications writing. It gives you an appreciation for standards and their use and legal implications. It also keeps you current with the concerns and advancement in the industry, and where we can be of assistance."

She believes it is vital to the Research Council that its professionals understand the organization's position as a testing agency, and their work as third party testers - "it is imperative that staff remain at arm's length from the manufacturer in providing quality assurance testing," she says.

Retirement will be a complete change of pace. In the immediate future she is looking forward to a "good rest and a holiday in Maine in time for the American Thanksgiving with family." Time, too, to devote to other interests, among them music. Long before Gladys became a scientist, she was an accomplished musician and holds her Toronto and London Conservatory degrees.

Employee changes

We welcome to the Research Council: **Martha Dochuk**, Clerk Typist, Industrial Development; **Lisa Hermanutz**, Research Technologist, Materials and Testing; **Anna Kaplansky**, Information Specialist, Coal Research; **Alwyn Kaye**, Research Officer, Materials and Testing; **Douglas Konkin**, Research Officer, Advanced Technologies; **Terry Jacula**, Research Technologist, Materials and Testing; **Brad Komishke**, Research Technologist, Oil Sands Research; **Patrick Fung**, Research Technologist, **Paul Grey**, Research Technologist, **Lynda O'Carroll**, Research Technologist, Biotechnology; **Susan Miller**, Clerk Typist, Human Resources; **Rachel Recto**, Clerk Typist, Oil Sands Research; **Janet Rogiani**, Clerk Typist, Materials and Testing; **Jerzy Sasiadek**, Technical Director, Advanced Technologies; **Lori Wolff**, Clerk Typist, Coal Research.

We wish the following well in new endeavours: **Peggy Burgess**, Oil Sands Research; **Roxanne Goddard**, Coal Research; **Cathy Lemko**, Biotechnology; **Katherine Maitland**, Industrial and Engineering Research; **Asif Shakur**, Terrain Sciences.

Scientist to work in Japan

Dr. Martin Stanley-Jones, Atmospheric Sciences Department, leaves for Japan this month for a year's research in image processing and computer graphics concerned with computer mapping.

He is one of six Canadian researchers in a scientific exchange program between the Canadian Department of Communication and the Nippon Telegraph and Telephone Corporation. He will be based at the NTT Electric Communication Laboratory in Yokosuka, south of Tokyo.

Support funding is being underwritten by the Research Council and the federal External Affairs Department.

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